



302666

# Five-Year Review Report

Pursuant to CERCLA

## First Five-Year Review Report

Sauget Area 2 Superfund Site

Sauget, Illinois

Prepared by:

U.S. Environmental Protection Agency

Region 5

Chicago, Illinois

In conjunction with:

Illinois Environmental Protection Agency

Springfield, Illinois

Approved By:

Richard C. Karl, Director  
Superfund Division

6-26-08

Date

[This page intentionally left blank.]

## Table of Contents

<b><u>Section</u></b>	<b><u>Page</u></b>
List of Acronyms.....	5
Executive Summary.....	7
Five-Year Review Summary Form.....	9
 <b>I. Introduction.....</b>	 <b>11</b>
 <b>II. Site Chronology.....</b>	 <b>12</b>
 <b>III. Background.....</b>	 <b>13</b>
Physical Characteristics.....	13
Land and Resource Use.....	14
History of Contamination.....	16
Initial Response.....	17
Basis for Taking Action.....	18
 <b>IV. Remedial Actions.....</b>	 <b>20</b>
Remedy Selection.....	20
Remedy Implementation.....	22
Institutional Controls.....	25
Operation and Maintenance (O&M).....	27
Costs and Operation.....	28
 <b>V. Progress Since the Last Five-Year Review.....</b>	 <b>29</b>
 <b>VI. Five-Year Review Process.....</b>	 <b>29</b>
Administrative Components.....	29
Community Notification and Involvement.....	30
Document Review.....	30
Data Review.....	30
Site Inspection.....	30
 <b>VII. Technical Assessment.....</b>	 <b>31</b>
Question A: Is the remedy functioning as intended by the decision documents?.....	 31
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?.....	 31
Question C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	 32
Technical Assessment Summary.....	32
 <b>VIII. Issues.....</b>	 <b>32</b>
 <b>IX. Recommendations and Follow-up Actions.....</b>	 <b>33</b>
 <b>X. Protectiveness Statement.....</b>	 <b>33</b>

<b>XI. Next Review.....</b>	<b>34</b>
-----------------------------	-----------

## **Tables**

Table 1 - Chronology of Site Events.....	12
Table 2 - Description of Sauget Area 2 Disposal Sites.....	13
Table 3 - Summary of Institutional Controls... ..	25
Table 4 - Groundwater Migration and Control System Down-time.....	27
Table 5 - Approximate O&M Costs from July 2003 through December 2007.....	28
Table 6 - Approximate Costs for O&M Activities through April 2007 .....	29
Table 7 - Issues.....	32
Table 8 - Recommendations and Follow-Up Actions.....	33

## **Attachments**

- Attachment 1 – Figures
- Attachment 2 – Ordinances for Village of Sauget and City of East St. Louis
- Attachment 3 – Screened Intervals of Wells and Piezometers
- Attachment 4 – State of Illinois Fish Advisories for Area near Sauget Area 2 Site
- Attachment 5 – Summary of Down-time for GMCS from 2003 through 2007
- Attachment 6 – Site Inspection Checklist
- Attachment 7 – Public Notice about Five-Year Review
- Attachment 8 – Documents Reviewed
- Attachment 9 – Applicable or Relevant and Appropriate Requirements (ARARs)
- Attachment 10 – Wastewater Discharge Permit for ABRTF



# List of Acronyms

<b>2,4-D</b>	2,4-dichlorophenoxyacetic acid
<b>ABRTF</b>	American Bottoms Regional Wastewater Treatment Facility
<b>AOC</b>	Administrative Order on Consent
<b>ARAR</b>	Applicable or Relevant and Appropriate Requirement
<b>BHC</b>	Benzene hexachloride
<b>CERCLA</b>	Comprehensive Environmental Response, Compensation, and Liability Act
<b>CFR</b>	Code of Federal Regulations
<b>COPC</b>	Chemical of potential concern
<b>COPEC</b>	Chemical of potential ecological concern
<b>cm/sec</b>	Centimeters per second
<b>DHU</b>	Deep Hydrogeologic Unit
<b>DNAPL</b>	Dense non-aqueous phase liquid
<b>FFS</b>	Focused feasibility study
<b>GMCS</b>	Groundwater Migration and Control System
<b>gpm</b>	Gallons per minute
<b>HDPE</b>	High-density polyethylene
<b>IAWC</b>	Illinois American Water Company
<b>IEPA</b>	Illinois Environmental Protection Agency
<b>IFCMP</b>	Illinois Fish Contaminant Monitoring Program
<b>MCL</b>	Maximum Contaminant Level
<b>MCP</b>	Methyl-chlorophenoxy-propionic acid
<b>MHU</b>	Middle Hydrogeologic Unit
<b>msl</b>	Mean sea level
<b>NCP</b>	National Contingency Plan
<b>NPL</b>	National Priorities List

<b>O&amp;M</b>	Operation and Maintenance
<b>OU</b>	Operable Unit
<b>PAH</b>	Polycyclic aromatic hydrocarbon
<b>PCB</b>	Polychlorinated biphenyl
<b>P-Chem</b>	Physical/Chemical Treatment Plant
<b>PCP</b>	Pentachlorophenol
<b>PDA</b>	Plume discharge area
<b>ppm</b>	part per million
<b>PRP</b>	Potentially Responsible Party
<b>RA</b>	Remedial Action
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>RD</b>	Remedial Design
<b>RI/FS</b>	Remedial Investigation/Feasibility Study
<b>ROD</b>	Record of Decision
<b>SHU</b>	Shallow Hydrogeologic Unit
<b>SVOC</b>	Semi-volatile Organic Compound
<b>TDS</b>	Total dissolved solids
<b>TOC</b>	Total organic carbon
<b>TRV</b>	Toxicity Reference Values
<b>USACE</b>	United States Army Corps of Engineers
<b>USEPA</b>	United States Environmental Protection Agency
<b>VOC</b>	Volatile Organic Compound

## EXECUTIVE SUMMARY

The Sauget Area 2 site is located on the eastern side of the Mississippi River directly opposite St. Louis, Missouri, and encompasses a total area of approximately 312 acres. More specifically, the Sauget Area 2 site is situated south of East St. Louis, Illinois, within the boundaries of the City of East St. Louis and the Villages of Cahokia and Sauget, Illinois. The site is located in an area historically used for heavy industry, including chemical manufacturing, metal refining, power generation and waste disposal. As a whole, the Sauget Area 2 site consists of five inactive disposal areas which are referred to as Sites O, P, Q, R and S. Three of the sites are closed landfills (Sites P, Q and R), one consists of four closed sludge lagoons (Site O), and one is a waste disposal site associated with an abandoned solvent reclamation facility (Site S).

The remedy selected in the interim Record of Decision (ROD) signed in September 2002, and the remedy being evaluated in this five-year review, is an interim remedy for the groundwater operable unit (operable unit 2 (OU2)) for the Sauget Area 2 site in the vicinity of Site R. The OU1 remedy will be a site-wide remedy and will address the final action for groundwater contamination along with the actions to be taken regarding source areas and any other contaminated media. The intent of the interim remedy for OU2 was to address the release of contaminated groundwater to the Mississippi River in the vicinity of Site R and the associated risks. The remedy consists of a 140-foot deep barrier wall that terminates in bedrock along with a groundwater extraction system. Together, the barrier wall and the extraction wells are referred to as the Groundwater Migration and Control System (GMCS). Although the length of the barrier wall corresponds to the edge of Site R, other sources of contamination that are upgradient of Site R and that may be contributing to the contaminated groundwater being treated by the GMCS include Sauget Area 2 Sites O, Q (dogleg), and S; Sauget Area 1 Site I; the W.G. Krummrich plant; and the Clayton Chemical facility.

The major objective in the OU2 interim ROD for the GMCS was to reduce the discharge of contaminated groundwater into the Mississippi River as measured by the attainment of a zero or inward hydraulic gradient across the barrier wall and a reduction in the mass flux of contaminants to the river. Available information indicates that the barrier wall was constructed according to appropriate standards and that the GMCS is functioning to remove significant volumes of contaminated ground water from the aquifer. Performance measures for the interim remedy, such as establishing the control algorithm for the GMCS, calculating the mass loading of contaminants to the Mississippi River, and making a determination about the most appropriate effectiveness measures for the interim remedy, are currently under discussion by USEPA and potentially responsible parties (PRPs) who are implementing the OU2 remedial action and undertaking the remedial investigation/feasibility study for the site (the implementing PRPs). Any changes to the approaches for measuring remedy performance will be incorporated into a decision document and other appropriate site documents (e.g., the Remedial Action Completion Report, the Operation and Maintenance Plan, and/or the final site-wide ROD).

A protectiveness determination for the OU2 interim remedy cannot be made until performance measures for the GMCS are developed and implemented. These performance measures will be developed and implemented as part of the on-going supplemental remedial investigation/feasibility study for the Sauget Area 2 site. It is expected that these measures will be finalized by the end of December 2009, at which time a protectiveness determination will be made through an addendum to this five-year review.

Although a protectiveness determination cannot be made at this time, the interim remedy for OU2 is addressing ecological exposure by serving to reduce the mass loading of contaminants to the Mississippi River by removing and treating contaminated groundwater. The potential for human exposure is being addressed by access and informational controls that limit recreational fishing in the vicinity of the site.

Although not called for in the OU2 interim ROD, two of the municipalities in which the Sauget Area 2 site is located, the Village of Sauget and the City of East St. Louis, have passed ordinances that prohibit the use of groundwater for drinking. The ordinances cover the majority of the Sauget Area 2 site.

As discussed in the OU2 interim ROD, final remedial actions for groundwater and source areas for the Sauget Area 2 site will be addressed under a site-wide operable unit (OU1) decision document upon completion of the supplemental remedial investigation/feasibility study for the site. The need for additional institutional controls will also be assessed as part of the final site-wide ROD. The actions implemented under the OU2 interim ROD are consistent with the anticipated final remedy for the site. A determination about long-term protectiveness will be made after the remedy selected in the final site-wide ROD is implemented.

This is the first five-year review report for Sauget Area 2.

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site name (from WasteLAN):** Sauget Area 2

**EPA ID (from WasteLAN):** ILD000605790

**Region:** 5

**State:** IL

**City/County:** Sauget, East St. Louis & Cahokia/St. Clair County

### SITE STATUS

**NPL status:** ☐ Final ☐ Deleted ☒ Other (specify) Proposed

**Remediation status** (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete

**Multiple OUs?\*** ☒ YES ☐ NO

**Construction completion date:** NA

**Has site been put into reuse?** ☐ YES ☒ NO

### REVIEW STATUS

**Lead agency:** ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency \_\_\_\_\_

**Author name:** Leah Evison

**Author title:** Remedial Project Manager

**Author affiliation:** USEPA

**Review period:\*\*** 10/09/07 to 8/18/08

**Date(s) of site inspection:** 11/7/2007

**Type of review:**

- ☒ Post-SARA    ☐ Pre-SARA    ☐ NPL-Removal only  
☐ Non-NPL Remedial Action Site    ☐ NPL State/Tribe-lead  
☐ Regional Discretion

**Review number:** ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) \_\_\_\_\_

**Triggering action:**

☐ Actual RA Onsite Construction at OU # \_\_\_\_\_

☒ Actual RA Start at OU#2 \_\_\_\_\_

☐ Construction Completion

☐ Previous Five-Year Review Report

☐ Other (specify)

**Triggering action date (from WasteLAN):** 8/18/2003

**Due date (five years after triggering action date):** 8/18/2008

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

### Issues:

Although the GMCS is removing contaminated groundwater from the aquifer, performance measures for the interim remedy have not been finalized. The measures include the approaches for calculating mass loading to the Mississippi River, controlling the pumping rates across the barrier wall to achieve a zero or inward gradient, and evaluating groundwater, surface water, and sediment data.

### Recommendations and Follow-up Actions:

Performance measures will be evaluated and implemented as part of the on-going supplemental remedial investigation/feasibility study and will be documented in a decision document and other appropriate site documents (e.g., Remedial Action Completion Report, Operation and Maintenance Report, and/or the final site-wide ROD).

### Protectiveness Statement(s):

A protectiveness determination for the OU2 interim remedy cannot be made until performance measures for the GMCS are developed and implemented. These performance measures will be developed and implemented as part of the on-going supplemental remedial investigation/feasibility study for the Sauget Area 2 site. It is expected that these measures will be finalized by the end of December 2009, at which time a protectiveness determination will be made through an addendum to this five-year review.

Although a protectiveness determination cannot be made at this time, the interim remedy for OU2 is addressing ecological exposure by serving to reduce the mass loading of contaminants to the Mississippi River by removing and treating contaminated groundwater. The potential for human exposure is being addressed by access and informational controls that limit recreational fishing in the vicinity of the site. Although not called for in the OU2 interim ROD, two of the municipalities in which the Sauget Area 2 site is located, the Village of Sauget and the City of East St. Louis, have passed ordinances that prohibit the use of groundwater for drinking. The ordinances cover the majority of the Sauget Area 2 site.

As discussed in the OU2 interim ROD, final remedial actions for groundwater and source areas for the Sauget Area 2 site will be addressed in decision document upon completion of the supplemental remedial investigation/feasibility study for the site. The need for additional institutional controls will also be assessed as part of the final site-wide ROD. The actions implemented under the OU2 interim ROD are consistent with the anticipated final remedy for the site. A determination about long-term protectiveness will be made after the remedy selected in the final site-wide ROD is implemented.

Date of last Regional review of Human Exposure Indicator (from WasteLAN): 9/28/2007

Human Exposure Survey Status (from WasteLAN): Insufficient data

Date of last Regional review of Groundwater Migration Indicator (from WasteLAN): 9/28/2007

Groundwater Migration Survey Status (from WasteLAN): Insufficient data

Ready for Reuse Determination Status (from WasteLAN): No

**SAUGET AREA 2 – SITE R SUPERFUND SITE  
ST. CLAIR COUNTY, ILLINOIS  
FIVE-YEAR REVIEW REPORT**

**I. INTRODUCTION**

**Authority and Purpose**

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and identify recommendations to address those issues.

USEPA is preparing this five-year review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

*[i]f the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

USEPA interpreted this requirement further in the NCP. 40 CFR §300.430(f)(4)(ii) states:

*[i]f remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

USEPA, Region 5, conducted the five-year review of the interim remedy for the groundwater operable unit being implemented at the Sauget Area 2 Superfund site (the Site) in the Village of Sauget, St. Clair County, Illinois. This review was primarily conducted by Mary Tierney, USEPA Region 5 Remedial Project Manager (RPM), with assistance from past USEPA RPM, Ross del Rosario, current USEPA RPM, Leah Evison, and Sandra Bron, Illinois Environmental Protection Agency (IEPA), for the period from October 2007 through June 2008. This report documents the results of the review. The final report will be placed in the USEPA site files and at the local repositories for the Sauget Area 2 site at the Cahokia Public Library District, 140 Cahokia Park Drive, Cahokia, Illinois. This is the first five-year review for Sauget Area 2.

The triggering action for this statutory review is the start of remedial action construction for operable unit 2 (OU2). This five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

## II. CHRONOLOGY

**Table 1. Chronology of Site Events**

<i>EVENT</i>	<i>DATE</i>
Industrial Salvage and Disposal, Inc., operated the industrial waste landfill now called Site R	1957 to 1977
Monsanto completed clay cover over Site R	1979
Monsanto completed stabilization project along Mississippi River adjacent to Site R	1985
State of Illinois and Monsanto signed a Consent Decree for a Remedial Investigation/Feasibility Study (RI/FS)	February 13, 1992
RI/FS Report completed	1994
First removal action conducted for OU1	February 1995 to March 1995
Second removal action conducted for OU1	October 1999 to April 2000
Monsanto signs a RCRA Administrative Order on Consent (AOC) with USEPA	May 3, 2000
Groundwater, surface water, sediment and fish sampling completed	2000
AOC for Sauget Area 2 RI/FS signed	November 24, 2000
Ecological Risk Assessment of Mississippi River performed	June 2001
Sauget Area 2 proposed to NPL	September 13, 2001
EPA sent a request to implementing PRPs to conduct a focused feasibility study (FFS) of Site R	November 14, 2001
FFS submitted to USEPA	April 1, 2002
Public comment period on Proposed Plan for Site R	June 17, 2002 to August 16, 2002
Interim Record of Decision (ROD) for Site R/Groundwater Operable Unit (OU2) signed	September 30, 2002
Unilateral Administrative Orders for Remedial Design/Remedial Action (RD/RA) for OU2 issued	September 30, 2002
Start of Remedial Design for OU2	February 15, 2003
Explanation of Significant Differences signed	July 30, 2003
RA construction start (OU2)	August 18, 2003
Interim Operating Period 1	December 2003 to February 2004
Performance Verification Sampling begins	June 2005



<i>EVENT</i>	<i>DATE</i>
<b>Interim Operating Period 2</b>	<b>August 2005 to October 2005</b>
<b>RA construction completed (OU2)</b>	<b>November 2005</b>
<b>Interim Operating Period 3</b>	<b>February 2006 to May 2006</b>
<b>Comprehensive comments document sent by USEPA to implementing PRPs</b>	<b>January 24, 2008</b>

### III. BACKGROUND

#### Physical Characteristics

Sauget Area 2 is located on the eastern side of the Mississippi River directly opposite St. Louis, Missouri (See Attachment 1, Figure 1). More specifically, the Sauget Area 2 site is situated south of East St. Louis, Illinois, within the boundaries of the City of East St. Louis and the Villages of Cahokia and Sauget, Illinois. The site extends approximately three-quarters to one mile east of the eastern bank of the Mississippi River.

The Sauget Area 2 site as a whole consists of five inactive disposal areas (Sites O, P, Q, R and S) described in Table 2 below. Of these disposal sites, three are closed landfills (Sites P, Q and R), one consists of four closed sludge lagoons (Site O), and one is a waste disposal site (Site S) associated with an abandoned solvent reclamation facility (See Attachment 1, Figure 2). The locations and acreage of each site are shown in the table below.

**Table 2. Descriptions of Sauget Area 2 Disposal Areas**

<b>Site Name</b>	<b>Size (acres)</b>	<b>Location</b>	<b>Description</b>
Site O	20	Sauget, Illinois	Located on Mobile Avenue, northeast of the American Bottoms Regional Wastewater Treatment Facility (ABRTF) and east of the flood control levee.
Site P	20	East St. Louis and Sauget, Illinois	Bounded by Illinois Central Gulf Railroad tracks, the Terminal Railroad Association tracks and Monsanto Avenue.
Site Q – northern portion	65	Sauget and Cahokia, Illinois	The northern portion of Site Q is bordered on the north by Site R and Monsanto Avenue; on the south by the main track of the Alton and Southern Railroad; on the east by the flood control levee; and on the west by the Mississippi River. The northern portion of Site Q that wraps around the eastern boundary of Site R is known as the “dogleg” portion of Site Q.
Site Q – southern portion	25	Sauget and Cahokia, Illinois	The southern portion of Site Q is bordered on the north by the Alton and Southern Railroad; on the south by Cargill Road; on the east by the flood control levee and the Illinois Central Gulf Railroad; and on the west by a 10-foot wide easement owned by Union Electric for

			transmission lines and a spur track of the Alton and Southern Railroad.
Site R	36	Sauget, Illinois	Site R is bounded on the north by Monsanto Avenue; on the east by the dogleg portion of Site Q; on the south by the main portion of Site Q; and on the west by the Mississippi River. The address for the site is 5 Riverview Avenue.
Site S	<1	Sauget, Illinois	Site S is less than one acre in size and is located southwest of Site O.

Sauget Area 2 is situated in a floodplain of the Mississippi River called the American Bottoms (see Attachment 1, Figure 3). In total, the American Bottoms floodplain encompasses 175 square miles, is 30 miles long, and has a maximum width of 11 miles. It is bordered on the west by the Mississippi River and on the east by bluffs that rise 150 to 200 feet above the valley bottom. The floodplain is relatively flat and generally slopes from north to south and from east to west. Land surface lies between 400 and 445 feet above mean sea level (msl).

Two types of water-bearing formations exist in the American Bottoms floodplain area: unconsolidated and consolidated. The unconsolidated formations (predominantly silt, sand, and gravel) are those that lie between the ground surface and the bedrock/gravel interface. The thickness of the unconsolidated formation varies throughout the area but is typically estimated to be approximately 100 feet. Finer-grained sediments generally dominate at the ground surface and become coarser and more permeable with depth, creating semi-confined conditions within the aquifer. The consolidated formations are deep bedrock units of limestone and dolomite that exhibit low permeability and are not considered to be a significant source for groundwater in the area. The groundwater level in the vicinity of Site R is generally between 10 to 20 feet below ground surface, but fluctuates during times of precipitation. Recharge to the aquifer occurs through four sources: precipitation, infiltration from the Mississippi River, inflow from the buried valley channel of the Mississippi River, and subsurface flow from the bluffs that border the floodplain on the east.

Three distinct hydrogeologic units can be identified in the vicinity of Site R: (1) a shallow hydrogeologic unit (SHU); (2) a middle hydrogeologic unit (MHU); and (3) a deep hydrogeologic unit (DHU). The 20 feet thick SHU includes the Cahokia Alluvium (recent deposits) and the uppermost portion of the Henry Formation. The 30 feet thick MHU is formed by the upper to middle, medium to coarse sand portions of the Henry Formation. At the bottom of the aquifer is the DHU, which includes the high permeability, coarse-grained deposits of the lower Henry Formation. This zone is 40 feet thick. Groundwater flow velocity is on the order of 0.02 feet per day (7 feet per year) in the SHU, 4 feet per day (1,500 feet per year) in the MHU, and 6 feet per day (2,200 feet per year) in the DHU.

During low river stage conditions, groundwater at Sauget Area 2 flows from east to west and releases to the Mississippi River, the natural point of release for groundwater in the American Bottoms aquifer. When flood stage occurs in the Mississippi River, flow reverses. Under these conditions, groundwater flows from west to east.

### **Land and Resource Use**

Heavy industry has been present on the east bank of the Mississippi River between Cahokia and Alton, Illinois, for nearly a century. Industrial activity in the area peaked in the 1960s. Although many industrial facilities have closed down throughout the American Bottoms floodplain, Sauget Area 2 and the

surrounding area is still highly industrialized (see Attachment 1, Figure 4). Currently, the area is used for industry, warehousing, bulk storage (coal, refined petroleum, lawn and garden products and grain), wastewater treatment, hazardous waste treatment, waste recycling and truck terminals. In addition to heavy industry, the area also has commercial facilities, bars, nightclubs, convenience stores and restaurants. A number of petroleum, petroleum product, and natural gas pipelines are located in the area.

No residential land use is located immediately adjacent to or downgradient of Sites O, P, Q, R and S and other industrial facilities in the Sauget area. Residential areas of Sauget and East St. Louis are separated from the Sauget Area 2 area by other industries or by undeveloped tracts of land. Limited residential areas exist approximately 3,000 feet to the northeast and southeast of the site. According to the 2000 census, the population of the Village of Sauget, which is where the majority of the Sauget Area 2 site is located, is 249.

In addition to manufacturing, Sauget and the surrounding areas have historically been used for waste disposal. Six closed landfills (Sauget Area 2 Sites P, Q and R and Sauget Area 1 Sites G, H and I), four closed sludge lagoons (Sauget Area 2 Site O), a closed tank-truck wash water lagoon (Sauget Area 1 Site L) and a waste disposal site (Sauget Area 2 Site S) associated with an abandoned solvent reclamation facility (Resource Recovery Group) are located in the Sauget area. The Sauget Area 1 site is proposed for the National Priorities List (NPL) and is currently being investigated. The W.G. Krummrich manufacturing plant is a Resource Conservation and Recovery Act (RCRA) facility located approximately 3,000 feet to the east of Site R. The W.G. Krummrich facility is conducting a remedial action under a RCRA Administrative Order on Consent.

In the past, groundwater from the American Bottoms aquifer was a major source of water for the area and was used for industrial, public, and irrigation purposes. Groundwater levels prior to industrial and urban development were near land surface. Intensive industrial withdrawal, along with the use and construction of a system of drainage ditches, levees, and canals to protect developed areas, lowered the groundwater elevation for many years. By the mid-1980s, however, the groundwater levels had increased due to reduced pumping, high river stages, and high precipitation. Currently, no groundwater is being pumped from the American Bottoms aquifer in the vicinity of Sauget Area 2 for public, private or industrial supply purposes.

Groundwater is not a source of drinking water in the area. The Village of Sauget and the City of East St. Louis have issued ordinances prohibiting the use of groundwater as a potable water source (See Attachment 2). These ordinances were issued in response to historic industrial land use in the region and resulting groundwater quality impairments. The Village of Cahokia has an ordinance that restricts groundwater use in part of the municipality, but it does not cover the portion of the Sauget Area 2 site that is located in Cahokia. Groundwater use restrictions will likely remain in place for the foreseeable future due to the extent of the groundwater quality impairments.

The source of drinking water for area residents is an intake in the Mississippi River. This intake is located at River Mile 181, approximately three miles north and upgradient of Sauget Area 2. The drinking water intake is owned and operated by the Illinois American Water Company (IAWC) of East St. Louis, and it serves the majority of residences in the area. IAWC supplies water to Sauget and also to portions of Cahokia and Centerville Township. Public water supply is the exclusive potable water source in the vicinity of the Sauget Area 2 site.

The nearest downstream surface-water intake on the Illinois side of the Mississippi River is located at River Mile 110, approximately 68 miles south of Sauget Area 2. This intake supplies drinking water to residents in the Town of Chester and surrounding areas in Randolph County, Illinois. The nearest

downstream public water supply on the Missouri side of the river is located at River Mile 149, approximately 29 miles south of Sauget Area 2. At this location, the Village of Crystal City, Missouri, utilizes a Ranney well adjacent to the Mississippi River as a source for drinking water.

The Mississippi River is the major surface water body draining the area. The stretch of the river adjacent to Site R is bounded by steep embankments lined with rip-rap. A few scattered structures in the river, such as a wing dam and a sunken barge, offer some access points for aquatic birds and mammals and potential protection for fish. In the vicinity of Site R, no bordering wetlands, appreciable bordering vegetation, or submerged or emergent vegetation are present. Recreational and commercial fishing does occur in the Mississippi River; however, no fishing access is available along the Site R border. The Sauget Area 2 property is used as habitat by at least six threatened and endangered species, including the federally threatened bald eagle and state endangered snowy egret and little blue heron.

Future land use for the Sauget Area 2 site and surrounding areas are anticipated to be similar to current land use.

### **History of Contamination**

As stated above, the Sauget Area 2 site as a whole consists of five inactive disposal areas -- Sites O, P, Q, R and S. A brief description of the disposal and contaminant history for each of the disposal sites is below.

Site O - In 1952, the Village of Sauget began operating a wastewater treatment plant in the area now referred to as Site O. In addition to providing treatment for the Village of Sauget, the plant treated effluent from a number of Sauget industries. In 1965, the four lagoons which comprise Site O were constructed at the site. Between approximately 1966 and 1978, the lagoons were used to dispose of clarifier sludge from the Village of Sauget wastewater plant. Compounds detected in subsurface soil and/or groundwater in the area of Site O include toluene, xylenes, trichloroethene, tetrachloroethene, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxin, chlorobenzenes, chlorophenols, and chloroanilines.

Site P - Disposal Site P was operated by Sauget and Company from 1973 to approximately 1984. It was an IEPA-permitted landfill and was used for municipal and industrial waste disposal. Some of the general industrial wastes accepted at Site P included diatomaceous-earth filter cake from the Edwin Cooper Company and non-chemical waste from Monsanto.

Site Q - Between the 1950s and the 1970s, Site Q operated as a landfill that accepted municipal waste, septic tank pumpings, drums, organic and inorganics wastes, solvents, pesticides, paint sludges, plant trash, waste from industrial facilities, and demolition debris. Disposal at Site Q occurred both on the surface and subsurface. Compounds detected in soil and/or groundwater in the area of Site Q include toluene, xylenes, PAHs, phthalates, chlorobenzenes, chlorophenols, including pentachlorophenol (PCP), and chloroanilines.

Site R - Industrial Salvage and Disposal Inc. operated the River's Edge Landfill, now called Site R, for Monsanto from 1957 to 1977. Hazardous and non-hazardous bulk liquid and solid chemical wastes and drummed chemical wastes from Monsanto's W.G. Krummrich plant and, to a lesser degree its Queeny plant in St. Louis, were disposed of at the site. Disposal began in the northern portion of the site and expanded southward. Wastes contained toluene, xylenes, PAHs, chlorobenzenes, chlorophenols, PCP, chloroanilines, phenols, aromatic nitro compounds, aromatic amines, aromatic nitro amines, chlorinated aromatic hydrocarbons, aromatic and aliphatic carboxylic acids and condensation products of these compounds.

Site S - In the mid-1960s, wastes from the former Clayton Chemical property were disposed of in a shallow, on-site excavation which is now designated as disposal Site S. The wastes were from the solvent recovery process at Clayton which involved steam-stripping. Still bottoms from the stripping process were disposed of at the site.

Three known groundwater concentration highs are present in groundwater beneath and upgradient of Sauget Area 2 Site R: one at Sauget Area 2 Sites R and Q immediately adjacent to the Mississippi River, another at the location of Sauget Area 2 Sites O and S, and a third at the W.G. Krummrich plant. Groundwater data indicate there is a distinct vertical stratification of total volatile organic compound (VOC) and total semi-volatile organic compound (SVOC) concentrations at Site R with concentrations decreasing with depth. The results below are from samples collected in January and May 2000.

	<u><b>Total VOC Concentration</b></u>	<u><b>Total SVOC Concentration</b></u>
	<b>(ppb)</b>	<b>(ppb)</b>
<b>Shallow Hydrogeologic Unit</b>	74,600	6,760,000
<b>Middle Hydrogeologic Unit</b>	47,210	1,529,000
<b>Deep Hydrogeologic Unit</b>	1,950	34,800

This distinct vertical concentration gradient, with the highest detected concentrations in the upper portions of the saturated zone, indicates that the waste material and/or dense non-aqueous phase liquid (DNAPL) in the SHU are acting as a source that impacts groundwater quality. Total SVOC concentrations of 6,760,000 in the SHU and 1,529,000 in the MHU indicate that DNAPL is probably present in the aquifer. Dissolution of DNAPL coating the aquifer matrix or trapped in aquifer pore spaces will act as a long-term, continuous source for impacting groundwater.

### **Initial Response**

A number of initial response actions have been taken at three of the five sites that comprise the Sauget Area 2 site. No action has been taken at Site P or Site S. Initial response actions taken at Sites O, Q, and R are summarized below.

#### Site O

In 1980, the Village of Sauget closed the four lagoons that comprise Site O by stabilizing the sludge with lime and covering it with approximately two feet of soil. The construction of the cover was not overseen or approved by either USEPA or IEPA. Currently, the former lagoons are vegetated.

#### Site Q

In 1993, Site Q was flooded and river currents unearthed a number of barrels containing hazardous waste. USEPA conducted a removal action in the northern portion of Site Q in 1995 to stabilize the area scoured by the flood waters. On October 18, 1999, USEPA initiated a second removal action at Site Q. USEPA excavated site waste from eight different areas on the 25-acre southern portion of Site Q. The excavations were primarily focused on two former ponds in the southeast corner of Site Q. Two waste streams were developed based on analytical results of the waste piles: a low-level waste stream with soil concentrations less than 50 part per million (ppm) of PCBs and a high-level waste stream with soil concentrations greater than 50 ppm of PCBs. Approximately 17,032 tons of waste, comprised of about 20 percent low-level waste and 80 percent high-level waste, were shipped off-site for disposal. In addition, 3,271 drums were removed and disposed of. The second removal action was completed on April 5, 2000.

### Site R

Pursuant to a negotiated agreement with the State of Illinois, Monsanto installed a clay cover on Site R in 1979 to cover the waste, limit surface water infiltration through the landfill, and prevent direct contact with the landfill material. The cover thickness ranges from 2 feet to approximately 8 feet. In 1985, Monsanto installed a 2,250 foot long rock revetment along the east bank of the Mississippi River downgradient of Site R. The purpose of the stabilization project was to prevent further erosion of the riverbank and thereby minimize potential for the release of waste material from the landfill. During a flood in 1993, Site R was flooded but the clay cap was not overtopped. No erosion of the riverbank or cap resulted from this flood.

### **Basis for Taking Action**

Several ecological risk and exposure assessments related to the Sauget Area 2 site have been completed. The results from the two ecological risk assessments completed in the 1990s are summarized in the OU2 interim ROD. The results from the most recent ecological risk assessments, the first completed in June 2001 and the second completed in draft form in August 2003, are summarized below. A comprehensive ecological risk assessment is being completed as part of the on-going remedial investigation for the Sauget Area 2 site.

During past ecological risk evaluations of the Sauget Area 2 site, the main area that has been studied extends approximately 2,000 feet along the riverbank next to Site R and 300 feet into the river channel. The study area is referred to as the plume discharge area (PDA) (see Attachment 1, Figure 5). Contaminated groundwater in the PDA originates for the most part from Sauget Area 2 Site R; however, some contaminated groundwater from two other Sauget Area 2 sites (Sites O and Q), Sauget Area 1 Site I, the W.G. Krummrich facility, and the Clayton Chemical facility may also be discharging to the river in this area. Other groundwater plumes related to the Sauget Area 2 site which are not being captured by the barrier wall are being assessed as part of the on-going remedial investigation.

In the 2001 assessment of ecological risk, surface water, sediment and fish tissue samples were collected from the Mississippi River. For the assessment, 29 chemicals of potential concern (COPCs) in soil and groundwater at Sauget Area 2 Site R were identified to be:

<u><b>VOCs</b></u>	<u><b>SVOCs</b></u>	<u><b>Pesticides/PCBs</b></u>	<u><b>Metals</b></u>
benzene	aniline	alpha-BHC <sup>1</sup>	antimony
chlorobenzene	4-chloroaniline	PCBs	arsenic
1,2-dichloroethane	naphthalene		beryllium
dichloroethylene	1,2-dichlorobenzene		boron
methyl chloride	nitrobenzene		nickel
methylene chloride	2-nitrochlorobenzene		thallium
tetrachloroethylene	phenol		cyanide
vinyl chloride	2,4-dimethylphenol		
	2-chlorophenol		
	2,4-dichlorophenol		
	2,4,6-trichlorophenol		
	pentachlorophenol		

The 2001 ecological risk assessment revealed that fish species are at risk from exposure to sediment; fish prey are at risk from exposure to surface water; and a number of compounds found in sediment, surface water and fish tissue were not found in areas upstream of the study area. Potential complete exposure

---

<sup>1</sup> Alpha-benzene hexachloride

pathways in the study area include: (1) sediment to benthic invertebrates via direct contact and ingestion; (2) surface water to invertebrates and fish through direct contact and ingestion; (3) benthic biota to higher order predators through the food chain; and (4) fish to piscivorous fish, mammals and birds via ingestion. The conclusions in the 2001 ecological risk assessment were:

- Fish species are at risk from exposure to sediment based on the results of toxicity testing.
- Fish prey, such as planktonic invertebrates, are at risk from exposure to surface water based on toxicity tests. Benthic organisms are also at risk from exposure to sediment based on laboratory toxicity tests. However, the inherent high-energy physical environment in the study area in the Mississippi River limits the number of benthic invertebrates. Therefore, benthic invertebrates are not abundant and are not considered an important prey component for fish at the study area.
- Fish are accumulating compounds, specifically methyl-chlorophenoxy-propionic acid (MCP), detected in study area sediments but not detected in reference sediments.
- There is a low potential risk to wildlife foraging on the media (sediment, surface water and fish) in the study area.
- There are a number of compounds without applicable sediment, surface water or tissue guidelines. Comparisons of study area concentrations to reference concentrations indicate a subset in concentrations in study area media that exceed the concentrations in reference media.
- In general, the impacts occur within 300 feet of the shoreline. All toxicity tests resulting in potential toxicity occurred within 150 feet of shore, with the exception of one station at 300 feet. This station is located downstream of a wing dam in an area where surface waters are more protected from strong currents.
- VOCs, SVOCs, and one herbicide are elevated at the surface water stations with toxicity, and VOCs and herbicides are elevated at the sediment stations with toxicity.

The field work related to the 2003 ecological risk assessment was conducted after the completion of the OU2 interim ROD and has not yet been finalized. The 2003 assessment included sampling surface water and sediment and was divided into two sections – an aquatic risk assessment and a floodplain risk assessment. The aquatic risk assessment came to the conclusion that no adverse ecological impacts were associated with the presence of chemicals of potential ecological concern (COPECs) in sediments in the Mississippi River and that limited adverse impact was associated with COPECs in surface water. Surface water bioassays indicated that acute toxicity was limited to the sampling area downgradient of Site Q and just downstream of Site R. The two organic compounds identified as the principal constituents of concern in surface water in the Mississippi River adjacent to the Sauget Area 2 site were p-chloroaniline and 2,4-dichlorophenoxyacetic acid (2,4-D).

The floodplain risk assessment evaluated potential risks to piscivores, herbivores, carnivores and plants in the floodplain in the vicinity of the Sauget Area 2 site. The assessment identified the potential for significant ecological impacts associated with surface soil found at Site O and Site S. The most significant COPECs at Site O included dieldrin, lindane, PCBs, dioxins/furans, aluminum and mercury, and the most significant COPECs at Site S included PCP, beta-BHC, endrin, lindane, and PCBs.

A human health risk assessment for the Sauget Area 2 site was also performed. Evaluation of exposure and risk due to Sauget Area 2 showed that potential risks to human health due to direct contact, ingestion or dermal adsorption of landfilled materials; direct contact with surface water; inhalation of wind-blown dust; and inhalation of volatile organics from the landfill were all considered to be low. Even under worst-case exposure assumptions, the estimated excess lifetime carcinogenic risk for all of these pathways combined was  $5.7 \times 10^{-6}$ . With respect to noncarcinogenic hazards, the analysis indicated that the hazard indices for all receptor groups and pathways combined were less than one for realistic and worst-case exposure scenarios.

#### **IV. REMEDIAL ACTIONS**

An interim ROD for operable unit 2 (OU2) was signed by USEPA in September 2002. This interim ROD presented an interim groundwater remedy to address the “release of contaminated groundwater into the Mississippi River at the Sauget Area 2 site in the vicinity of disposal Site R”. Physical construction of the OU2 remedial action began in August 2003 and was completed in November 2005. Although there have been multiple removal actions at the Sauget Area 2 site, the interim remedy at Site R is the only CERCLA remedial action that has been conducted at Sauget Area 2. The focus of this five-year review is on the OU2 interim remedial action constructed adjacent to Site R.

##### **Remedy Selection**

The following remedial action objectives were identified for the interim groundwater remedial action:

- Protection of aquatic life in surface water and sediments from exposure to site contaminants;
- Prevention or abatement of actual or potential exposure to nearby human populations (including workers), animals or the food chain from hazardous substances, pollutants or contaminants;
- Prevention or abatement of actual or potential contamination of drinking water supplies and ecosystems;
- Achievement of acceptable chemical-specific contaminant levels, or range of levels, for all applicable exposure routes; and
- Mitigation or abatement of the release of contaminated groundwater in the plume area to the Mississippi River so that the impact is “insignificant” or “acceptable” as required by the May 3, 2000 W.G. Krummrich RCRA Administrative Order on Consent (AOC) (USEPA Docket No. R8H-5-00-003).

The selected interim remedy was chosen because it would greatly reduce the environmental impacts associated with the release of contaminated groundwater to the Mississippi River in the vicinity of Sauget Area 2 Site R. This was to be accomplished through the containment and extraction of contaminated groundwater downgradient of Sauget Area 2 Site R, thereby reducing mass loading to the Mississippi River. Reduction of mass loading would abate aquatic organism exposure to impacted groundwater, contamination of ecosystems, and sediment toxicity.

The major components of the interim groundwater remedy as described in the OU2 ROD were:



- **Physical Barrier** - A 3,500 foot long, "U"-shaped, fully penetrating, jet grouted barrier wall between the downgradient boundary of Sauget Area 2 Site R and the Mississippi River to abate the release of impacted groundwater. The barrier wall would extend to the top of the bedrock surface (approximately 120 to 140 feet deep). The purpose of the barrier wall would be to minimize the volume of groundwater that has to be extracted to ensure equal hydraulic heads on both sides of the wall.
- **Groundwater Extraction** - Three partially penetrating groundwater recovery wells, capable of pumping a combined total of 303 to 724 gallons per minute (gpm), inside the "U"-shaped barrier wall to abate groundwater moving to the wall.
- **Groundwater Treatment** - Once extracted, the contaminated groundwater would be treated and ultimately discharged to the Mississippi River. Selection of the treatment technology(ies) and the location of the treatment system would be determined during the remedial design. For the purpose of estimating the approximate cost of the treatment component of the selected remedy, it was assumed that extracted groundwater would be routed to the American Bottoms Regional Wastewater Treatment Facility (ABRTF) via subsurface pipeline. ABRTF provides primary treatment as well as secondary biological treatment enhanced by powdered activated carbon.
- **Groundwater Quality Monitoring** - Groundwater samples would be collected quarterly until the final groundwater remedy and associated groundwater monitoring program for the Sauget Area 2 site was in place. Mass loading for each hydrogeologic unit would be calculated, and total mass loading to the Mississippi River would be determined by summing the mass loads for the SHU, MHU and DHU. Total mass loading would be plotted over time to track changes in the amount of mass being released to the Mississippi River.
- **Groundwater Level Monitoring** - Groundwater level monitoring would be done to ensure acceptable performance of the physical barrier.
- **Sediment and Surface Water Monitoring** - Sediment and surface water samples would be collected in the plume release area to determine the effect of any contaminants migrating through, past or beneath the barrier wall and being released to the Mississippi River. Impact would be determined by comparing constituent concentrations to site-specific, toxicity-based, protective concentrations derived from existing sediment and surface water chemistry and toxicity data. An apparent effects threshold approach would be used to derive site-specific, protective constituent concentrations for sediments and a toxic units approach would be used to derive site-specific, protective constituent concentrations for surface water. Constituent concentrations would be plotted as a function of time and compared to the site-specific, toxicity-based, protective concentrations to determine progress toward achieving these targets.
- **Institutional Controls** - Institutional controls would be used to limit fishing in the plume release area. Access to the Mississippi River in the plume release area is limited by existing fencing at Site R, a very steep riverbank and the absence of public roads leading to this area. Additional institutional controls would include warning signs posted at the top of the riverbank in the plume release area and in nearby river access areas. A public education program would be implemented by the appropriate government agencies to inform the public that fish in the impacted groundwater release area may contain site-related constituents and to assure public awareness of the potential risks, if any, which may be associated with consumption of fish caught in the plume release area.

The ROD further stated that the gradient control achieved by the remedy would be determined by comparing water level elevations in pairs of fully penetrating piezometers that would be installed on both the inside and outside of the barrier wall. Pumping rates were to be adjusted so that the water level elevation in the inside piezometer was the same as the water level elevation in the outside piezometer. To supplement this gradient control information from the newly-installed piezometers, groundwater levels would also be measured on a quarterly basis in ten existing piezometers.

In July 2003, USEPA signed an Explanation of Significant Differences (ESD) to modify the OU2 interim remedy. The ESD documented that a conventional soil-bentonite slurry barrier wall would be constructed instead of a jet grouted barrier wall. This change did not affect the scope of the interim remedy.

### **Remedy Implementation**

The two main components of the remedial action called for in the OU2 interim ROD were the construction of the barrier wall and the installation of three groundwater recovery wells. The wall along with the extraction wells are referred to as the Groundwater Migration Control System, or GMCS. Although the three extraction wells are intended to be the principal groundwater control measure, the barrier wall serves to reduce the volume of groundwater flowing into the extraction system from the Mississippi River during operation of the extraction wells, thereby reducing operation and maintenance (O&M) costs by reducing the volume of water treated. Construction of the remedy began in 2003 and was completed in 2005.

#### **Barrier Wall**

Information on the completion of the wall and construction of the extraction wells that is presented below is from the draft Barrier Wall Completion Report, dated February 16, 2006. The draft report has been reviewed by USEPA and is currently being revised by the implementing PRPs.

The barrier wall is U-shaped and was constructed to form a separation between Site R and the Mississippi River (see Attachment 1, Figure 2). The total length is 3,273 feet. Vertically, the wall extends from about 3 feet below grade to the top of bedrock, which varies from 132 to 143 feet below grade. Approximately 2,000 feet of the length of the wall runs parallel to the river bank. The two “arms” of the U each extend approximately 650 feet eastward from the north and south sides of Site R. Instead of a jet-grouted design as planned in the OU2 interim ROD, the wall was excavated using the bentonite slurry method and was backfilled with a design mixture of soil and bentonite. The barrier wall was designed to reduce recharge from the Mississippi River in the MHU and DHU and to act as a continuous barrier with minimal gaps. The draft Barrier Wall Completion Report stated that the average design permeability of the in-place wall was specified to be less than  $1 \times 10^{-7}$  centimeters per second (cm/sec) based on laboratory testing.

The slurry trench method of excavation consists of excavating a trench in the existing soils while at the same time keeping the trench filled with a bentonite-water slurry mixture. The slurry is displaced by backfill material as the wall is constructed. Bentonite is natural clay, and slurry is a stable, colloidal suspension of powdered bentonite in water. The backfill material is less permeable than the native material, resulting in a barrier that impedes groundwater flow.

In addition to bentonite and water, materials used for the barrier wall included naturally-deposited, on-site and off-site soils, imported borrow clay, and the in situ soils along the wall alignment. The mixture for the backfill was proportioned to provide a hydraulic conductivity of less than or equal to  $1 \times 10^{-7}$  cm/sec or lower when mixed to a homogenous consistency with the exception that 20 percent of the test specimens could have a permeability as high as  $5 \times 10^{-7}$  cm/sec and five percent of the test specimens could have permeability as high as  $1 \times 10^{-6}$  cm/sec. Non-toxic and biodegradable

admixtures such as fluidifiers and retarders could have been used based on the design, but these were not needed. The actual backfill mix was determined by multiple laboratory compatibility tests and bench scale tests. On-site soil material for the backfill mix was excavated from the slurry trench and off-site soil material was brought to the site from an approved off-site source. The maximum allowable particle size in the backfill was 3 inches. Prior to pumping into the trench, the slurry was tested for the following parameters based on site conditions: percent bentonite (by weight), slurry unit weight, apparent viscosity, rate of filtrate loss, and pH. At a minimum, one quality assurance test of permeability and gradation testing of the prepared backfill was performed for every 3,000 cubic yards of backfill prepared and placed.

Nine notices of non-compliance were issued during the course of the construction of the barrier wall. The notices related to backfill gradation samples, trench slurry viscosity samples, and trench slurry density samples that did not meet the specification requirements. Each of these issues were reviewed with USEPA and resolved.

One element of the barrier wall installation that required a modification to the design and impacted the completion schedule of the wall was the discovery of subgrade conditions that were unstable under construction loads. This was encountered when 20 feet thick of previously placed fly ash was discovered near the south end of the site. To address this problem, wick drains were installed throughout the unstable area. The drains allowed the perched water table to drain downward through a cemented fly ash layer into the lower sand layers.

Construction of the barrier wall generated spoils that were collected and transferred to a stockpile on top of Site R. The actual volume of the stockpile on top of Site R was surveyed and calculated to be 21,090 cubic yards. In addition, 17,585 cubic yards of spoils were spread along the inside of the slurry wall to promote drainage. The spoils adjacent to the barrier wall were covered with a minimum of 6 inches of topsoil and then seeded to form a vegetative cover.

Spoils were handled by different methods depending on which portion of the barrier wall was being constructed. For the section of the barrier wall parallel to the river, the majority of the spoils were contained within a holding area constructed by building a berm between the landfill and the slurry wall. The area within the berm was low and formed an effective containment area for the spoils and excess slurry. Fluid spoils were hauled to temporary drying pits, after which the spoils were removed and trucked to the stockpile where they were placed and compacted. Drying pits were restricted to areas outside of the existing Site R landfill, but within the Site R property boundaries. The stockpile area was selected based upon access to the barrier wall construction activities, as well as the utilization of the clay cap material and topographic features of Site R. The perimeter of the stockpile was constructed of clean soil material imported from an off-site borrow source.

The filled spoils stockpile on top of Site R was covered with a clean soil leveling layer followed by a high-density polyethylene (HDPE) geomembrane cover. An additional clean soil layer was placed on top of the HDPE material and was seeded to form a vegetative layer. The long term plan is to incorporate this stockpile into the final site-wide remedy for Sauget Area 2.

On-site and imported fill materials were used to construct the cap over the barrier wall. A layer of 20 mil plastic sheeting and a reinforcement grid were installed to preserve the integrity of the barrier wall backfill and separate the cap material from the backfill. Drainage swales were constructed to the original grades.

#### Extraction Wells, Monitoring Wells and Piezometers

The other primary elements of the GMCS installed during the remedial action were the three extraction wells, twelve monitoring wells, and eight piezometers. The three extraction wells play a critical role in the GMCS by serving to reduce the volume of water flowing into the barrier wall. Each of the partially penetrating groundwater recovery wells has a maximum pumping capacity of between 700 and 750 gpm, which provides a total system capacity of about 2200 gpm. A total of twelve monitoring wells, in four three-well clusters, were installed downgradient of the physical barrier to determine mass loading to the Mississippi River resulting from any contaminants migrating through, past or beneath the barrier wall. Piezometer pairs – one on the upgradient side of the barrier wall and the other on the downgradient side of the barrier wall – were installed at least 200 feet apart at four locations. See Attachment 1, Figure 6, for locations of wells and piezometers and Attachment 3 for screened intervals of the wells and piezometers.

Over 1,000 feet of below-grade pipeline was installed to transfer water from the GMCS extraction wells to the American Bottoms Regional Wastewater Treatment Facility (ABRTF). The ABRTF is operated by the Village of Sauget and uses biodegradation and carbon adsorption systems to treat wastewater. The terminal point of the discharge pipeline from Site R is at two concrete manholes located at the northeast corner of the ABRTF Physical/Chemical Treatment (P-Chem) Plant property. An automatic water sample collection device is installed at the discharge vaults to collect and test the water prior to treatment. The total flow at the ABRTF discharge point is compared with the sum of the flows measured at the extraction wells every ten minutes. If the flow measurements differ by more than five percent, a leak alarm is triggered and the pumping is stopped.

#### GMCS Control Methodology

To achieve the goal of the OU2 interim ROD to capture all groundwater flowing into the barrier wall by maintaining a zero or negative (inward) hydraulic gradient, the pumping rates of the extraction wells are adjusted every ten minutes based on a control algorithm. Several control algorithms have been used since the GMCS began operating in 2003, and the determination of which method to adopt permanently is under review by USEPA and the implementing PRPs. Three technical memoranda have been prepared by the implementing PRPs summarizing data collected on the system and recommending control methodology approaches and further data collection needs. The various approaches for capturing all groundwater flow into the wall are briefly discussed below. A final determination about the control algorithm for the GMCS will be made prior to finalizing the site-wide OU1 ROD.

In the OU2 interim ROD, it was specified that the gradient would be controlled by monitoring groundwater levels in four pairs of piezometers on either side of the wall. The gradient across the four pairs is measured every minute and transmitted via radio to the GMCS control building. Data from the piezometers is averaged over a 10-minute period, and these averages are utilized to calculate and adjust the extraction wells flow rate every 10 minutes as needed. In the technical memorandum for Interim Operating Period I (April 2005), the implementing PRPs concluded that the goal of a zero or negative (inward) gradient across the wall was not achievable. Since that time, two additional Interim Operating Period Technical Memoranda have been prepared and a number of different approaches for gradient control have been proposed and tested. During one operating period, data collected showed a strong correlation between the elevation of the Mississippi River and the required pumping rate for the GMCS. Based on this correlation, one proposal was to have river stage be the primary control for the extraction well pumping rates and to use groundwater levels across the barrier wall as the secondary control. In this approach, a simple “look-up” table would be developed and used to control the pumping rates based on the river levels.

As part of another alternative for controlling the GMCS, in May 2005, four new pairs of piezometers were installed at the site. Using these new piezometers, the proposed method for controlling flow was to average the gradient from all four pairs and use Darcy's law equation to calculate the amount of flow into the U-shaped wall. This flow would then be divided by three to arrive at the required pumping rate for each of the three extraction wells. Currently, a variation of this approach is being used to control the system: flow is calculated based on two pair of piezometers instead of four and only two of the three extraction wells are routinely operated. The most recent proposed approach for controlling the flow regime of the GMCS is to use computed groundwater flowline deflection angles to make adjustments to the pumping rates so that flowlines are perpendicular to the north/south alignment of the barrier wall. As stated previously, these alternatives for operating the GMCS are currently being evaluated by USEPA and a final determination will be made prior to finalizing the site-wide OU1 ROD for the site.

#### Performance Measurements for Interim Remedy

The OU2 ROD contemplated several ways of measuring the performance of the interim remedy. One measure, as discussed in the previous section, was the maintenance of a zero or inward hydraulic gradient across the barrier wall. This measure is currently being discussed by USEPA and the implementing PRPs. Other performance measures discussed in the OU2 interim ROD were calculation of the mass flux of contaminants into the Mississippi River, establishment of site-specific toxicity based limits for surface water and sediment, and analysis of groundwater trends. Each of these measures is under discussion by USEPA and the implementing PRPs. The best approach for each performance measure will be determined prior to completing the final site-wide ROD.

#### **Institutional Controls**

The institutional controls referenced in the ROD as a component of the OU2 remedy are mainly informational tools. Access controls supplement the informational tools. Current institutional controls at the Sauget Area 2 site are summarized below:

**Table 3. Summary of Institutional Controls**

<b>Media, Engineered Controls, and Areas that do not Support UU/UE Based on Current Conditions</b>	<b>IC Objective and Restrictions</b>	<b>Title of IC Instrument Implemented</b>	<b>Required as part of interim remedy?</b>
Groundwater discharge to surface water (see Attachment 1, Figure 5)	Restrict fishing near contaminated areas	Fish advisories and warning signs	Yes
Groundwater (review of extent of groundwater contamination is being done as part of remedial investigation (RI); map showing extent of contamination will be included in final RI report	Prohibit groundwater use	Ordinance #99-5- Village of Sauget Ordinance #97-10066 - City of East St. Louis	No, but will be reviewed under final site-wide remedy

One objective of the access controls listed in the OU2 interim ROD was to limit fishing in the plume release area. Access to the Mississippi River in the plume release area is limited by existing fencing at Site R, locked entrance gates, a very steep riverbank and the absence of public roads leading to the area. Informational controls used at the site include warning signs posted near the northern and

southern portions of Site along the riverbank. Routine maintenance in the draft Operation and Maintenance (O&M) Plan includes quarterly inspections of warning signs, perimeter fencing and locks to ensure they are in place and effective.

The OU2 interim ROD also discussed a potential public education program to inform the public that fish in the impacted groundwater release area may contain site-related constituents and to increase public awareness of the potential risks that may be associated with consumption of fish caught in the plume release area. No public education program specifically regarding the Sauget Area 2 site has been implemented; however, the State of Illinois has issued a number of fish advisories for sections of the Mississippi River, including the section adjacent to and downgradient of Site R (see Attachment 4). These advisories are issued by the Illinois Fish Contaminant Monitoring Program (IFCMP), which consists of staff from a number of different State agencies including IEPA, Illinois Department of Public Health and the Illinois Department of Natural Resources. Fish consumption advisories are available on the internet and at facilities that sell fishing licenses. For the section of the Mississippi River adjacent to and downgradient of Site R, consumption advisories have been issued for channel catfish, sturgeon, and carp. The contaminants of concern on which the advisories are based are chlordane and PCBs. The need for a public education program specifically regarding the Sauget Area 2 site will be re-evaluated in the final site-wide ROD.

Although not required by the OU2 interim ROD, two institutional controls that are in place in the vicinity of Site R are ordinances passed by the Village of Sauget in 1999 and by the City of East St. Louis in 1997 (see Attachment 2). Both ordinances prohibit use of groundwater for drinking within the corporate limits of the municipality. The portion of Sauget Area 2 that is not covered by an ordinance that prohibits the use of groundwater is the part of the site located in the Village of Cahokia. The majority of the area located in Cahokia is comprised of the southern portion of Site Q. A limited portion of the northern portion of Site Q may also be located in Cahokia. The evaluation of institutional controls prohibiting groundwater use in the area of the Sauget Area 2 site will be part of the final site-wide ROD.

Another informational control in place for the site are excavation restrictions to protect construction workers at Site R. The restrictions are in place to prevent trenching without appropriate protection of construction workers and define requirements for training, protection and monitoring of construction and outdoor industrial workers.

#### Current Compliance

Routine maintenance in the draft O&M Plan includes quarterly inspections of warning signs, perimeter fencing and locks to ensure they are still in place and effective. During interviews with local officials and the implementing PRPs, no problems were noted. Although not required in the OU2 interim ROD, it was noted during this review that one portion of Site R, the area located in the Village of Cahokia, is not covered by an ordinance prohibiting groundwater use. The area in question, however, is the southern portion of the Site Q landfill, and no drinking water wells are present or are likely to be installed.

#### Long-Term Stewardship

As stated above, the draft O&M Plan includes quarterly inspections of warning signs, perimeter fencing and locks. In the final O&M Plan, the scope of the inspections may be expanded to include confirming that fish advisories are still in effect. As part of the on-going remedial investigation of the Sauget Area 2 site, a human health risk assessment is being developed which will evaluate the risks posed by fish consumption. The final site-wide ROD for the site will evaluate the adequacy of the fish advisories currently in place and determine if other measures are necessary. If it is determined in the

final ROD that additional institutional controls are necessary, a long-term plan for evaluating, monitoring and maintaining the additional controls will be developed.

### **Operation and Maintenance (O&M)**

The current quarterly sampling program includes collection of groundwater quality samples from wells in the shallow, intermediate and deep aquifers. Twelve monitoring wells located at four different locations are sampled as part of O&M. Quarterly sampling events typically occur in March, June, September and December. In addition, five surface water and five sediment samples from the Mississippi River are collected semiannually, typically in March and September. Samples are analyzed for the following constituents: VOCs, SVOCs, pesticides, herbicides, and metals. Groundwater samples are also tested for total organic carbon (TOC) and total dissolved solids (TDS).

Data collected each minute includes groundwater elevations in extraction wells, flow rates of pumps at extraction wells, groundwater elevations in piezometers, and river stage readings. These data are averaged on an hourly basis and only the hourly averages are recorded in the database. Well screen intervals for monitoring wells, piezometers and extraction wells are listed in Attachment 3.

The down-time for the GMCS from 2003 to 2007 is summarized in Table 4. Attachment 5 provides more detail about the down-time periods. The longest period during which the system was not operational was a 27-day period when the extraction wells were being tested for sand content. This was based on a request made by USEPA. The next longest shut-down time, accounting for 17.1 percent of total down-time, was due to requests on five separate occasions from American Bottoms Regional Wastewater Treatment Facility (ABRTF). The longest time the system was not operating at the request of ABRTF was four days. The next two most prevalent reasons for the system being shut down were power supply failures and the need to replace the pumps. These accounted for 10.5 and 10.8 percent of total shut-down time, respectively. Pump replacement is part of planned routine maintenance. Other planned maintenance activities accounted for 3.5 percent of the total down time. The remainder of the time the GMCS was not operating was due to the need for unplanned repairs. This accounted for only 1.4 percent of the total shut-down time.

**Table 4. Groundwater Migration and Control System Down-time**

<b>Reason for Down-time</b>	<b>Hours not Operational</b>	<b>Percent of Total Down-time</b>
EPA request for testing	648	56.6
Requested by ABRTF	196	17.1
Pump replacement	124	10.8
Power supply failure	120	10.5
Planned maintenance	40	3.5
Unplanned repairs	16	1.4

Several of the problems that have been encountered with the GMCS are: deterioration of the pitless adaptors in the extraction wells, erosion of pump lines, corrosion and malfunctioning of transducers on

extraction wells and piezometers, and subsidence in the cover of the stockpile containment cell. Each of these issues has been addressed as they occurred. EPA will ensure that appropriate prevention and monitoring measures are incorporated into the final O&M plan or, in the case of cover material, into the final remedy for the Site. Further descriptions of the problems with the Site R cover are provided below.

Two areas of subsidence have been observed on the Site R landfill – one in the fall of 2005 and one in the fall of 2006. In October 2005, a hole observed on the landfill cover was approximately two feet by three feet in area and about five feet deep. The hole was filled with approximately 4 to 5 cubic yards of grout, and after the grout was allowed to set, the area was backfilled with 12 to 18 inches of compacted clay.

A second depressed area was observed in the fall of 2006. The depression was between 3 and 4 feet in diameter and approximately 18 inches deep (see Attachment 1, Figures 7, 8, and 9). Unlike the hole discovered the previous year, however, the cover was still intact. The depressed area was staked and observed until November 2007. It did not increase in size or depth over this period, and it was concluded that the area was stable. To prevent further ponding of water in the area, it was backfilled and leveled with compacted clay in November 2007.

A comprehensive list of routine maintenance activities for both the barrier wall and the extraction system is included in the draft O&M Plan. Some of the routine O&M activities include making backups of data, measurement of back pressure in discharge lines at each well, inspection of motors and leads, periodic downhole video inspection of well screens, checking for biofouling in wells, verification of valve settings in actuators, and checking A/C and heater filters. In addition, on a quarterly basis, the stockpile containment cell cover is inspected for erosion and ponding caused by settlement; warning signs, fencing and locks are checked; and erosion controls and drainage structures are inspected. The alignment of the slurry wall is checked annually for signs of settlement or subsidence. The implementing PRPs are currently revising the draft O&M plan based on comments from USEPA. The O&M Plan will be finalized in 2009.

### **Costs and Operation**

Approximate annual costs of O&M for the Sauget Area 2 site from July 2004 through December 2007 are shown in Table 5 below. These costs represent information available as of March 2008 and differ slightly from those reported in the Site Inspection Checklist that was filled out by the implementing PRPs in November 2007 (see Attachment 6, pp. 3-4). Based on the figures in Table 4, the average annual cost for the years 2004 through 2007 is \$3,125,000. The estimate for annual O&M expenditures in the 2002 ROD was \$1,749,000. Adjusted for inflation, this would be approximately \$2,100,000 per year in 2007 dollars. The ROD indicated that actual costs may range from \$1,470,000 to \$3,150,000, that is, from 30 percent less than this estimate to 50 percent greater than this estimate. The actual average cost of \$3,125,000 falls within this range but is near the higher end of the estimate. Increases in treatment costs may account for the actual costs being near the high end of the estimated range.

**Table 5. Approximate O&M Costs from July 2003 through December 2007**

<b>Time Period</b>	<b>Cost</b>
7/15/03 to 12/31/03	800,000
1/1/04 to 12/31/04	3,200,000



Time Period	Cost
1/1/05 to 12/31/05	4,600,000
1/1/06 to 12/31/06	2,500,000
1/1/07 to 12/31/07	2,200,000
<b>TOTAL</b>	<b>\$13,300,000</b>

Table 6 provides a breakdown of estimated costs through April 2007. The total costs in the table are approximate only and do not correspond exactly to the costs in Table 5. They are presented here, however, to provide a general indication of what the relative expenses are for several different categories of O&M activities. As shown in the table, water treatment charges and costs for carbon accounted for approximately 85 percent of the total costs through April 2007.

**Table 6. Approximate Costs for O&M Activities through April 2007**

Activity	Cost
Maintenance of barrier wall	\$26,771
Water treatment charges	6,926,746
Sampling and O&M for extraction system	1,339,010
Carbon supply	1,466,298
Management	73,696
Communication system	4,302
<b>TOTAL</b>	<b>\$9,836,823</b>

## **V. PROGRESS SINCE THE LAST FIVE-YEAR REVIEW**

This is the first five-year review for the site.

## **VI. FIVE-YEAR REVIEW PROCESS**

### **Administrative Components**

IEPA and the implementing PRPs were notified of the initiation of the five-year review in October 2007. USEPA was the lead-Agency for the review.

The components of the five-year review schedule include:

- Community Notification and Involvement
- Document Review
- Data Review

- Site Inspections
- Report Development and Review

### **Community Notification and Involvement**

A public notice was published on October 20, 2007, in the *Belleville News-Democrat* announcing that a five-year review of Sauget Area 2 Site R was to be conducted (see Attachment 7).

Interviews with city officials and the Director of ABRTF were held on November 7, 2007.

According to city officials, residents are concerned about the contamination at the Sauget Area 2 but understand that steps are being taken to address the issues. Generally, residents are not familiar with the details concerning Site R and the construction of the barrier wall; however, the community is very aware of the contamination in the area due to the Sauget Area 2 site and other nearby sites and facilities. City officials are satisfied with the progress being made. The Director of the ABRTF stated that the treatment facility had not had any problems with handling either the volume or nature of the extracted groundwater from Site R. According to the director, the ABRTF facility would, in fact, have the capacity to treat almost three times the volume of water they are currently treating.

### **Document Review**

This five-year review consisted of a review of relevant documents including the ROD, ESD, investigatory reports and studies, correspondence, memoranda, construction specifications, remedial action construction reports, and monitoring data (see Attachment 8). The remedial investigation/feasibility study (RI/FS) report for Sauget Area 2 is in the process of being finalized, so the final RI/FS report was not reviewed. Applicable cleanup standards and goals, and applicable or relevant and appropriate requirements (ARARs), as listed in the 2002 ROD, were also reviewed (see Attachment 9).

### **Data Review**

The performance measures specified in the OU2 interim ROD were: (1) calculation of mass loading to the Mississippi River, (2) control of the gradient across the barrier wall, and (3) results of groundwater, surface water, and sediment sampling. Although required sampling and data collection has occurred, the approaches for each of the performance measures are currently being discussed by USEPA and the implementing PRPs. Any changes to the performance measures will be documented prior to completing the final site-wide ROD. To come to a resolution regarding the method for calculating mass loading to the Mississippi River, the implementing PRPs submitted a proposal to USEPA which is currently being reviewed. The implementing PRPs will also be submitting a summary of the data collected during each of the three Interim Operating Periods along with a proposal for the control algorithm for controlling the gradient across the barrier wall.

No compliance violations related to the Sauget Area 2 site have occurred at ABRTF between 2003 and 2007. On five separate occasions during this time period, ABRTF requested that the implementing PRPs shut down the GMCS. Most of these requests were due to heavy storm events. A copy of the wastewater discharge permit for the ABRTF, which includes site-specific parameters, is in Attachment 10.

### **Site Inspection**

The five-year review site inspection for Site R was conducted on November 7, 2007, by USEPA and IEPA. Several staff from the consultants for the implementing PRPs were also present. The purpose of the inspection was to assess the progress of remedy implementation, ensure records and site documents were available and up-to-date, inspect the extraction system to verify it was

operational and did not appear to have significant problems or flaws, and view general site conditions. The intent was to collect information to be able to better assess the protectiveness of the remedy and try to foresee any future remedy implementation problems and needs. Site inspection notes are included in Attachment 6. The checklist was filled out by the implementing PRPs. Handwritten annotations are comments entered by USEPA.

Observations during the site inspection indicated that the site is well-maintained, roads are in good condition, and the extraction and monitoring wells are properly secured. No evidence of vandalism or trespassing was noted. As part of the site inspection, the Director of ABRTF was interviewed. The ABRTF treatment plant was well-maintained, and no significant problems were noted.

## **VII. TECHNICAL ASSESSMENT**

### **Question A: Is the remedy functioning as intended by the decision documents?**

Although current information suggests that the remedy is likely functioning as intended, the answer to this question will be deferred pending the finalization of performance measures for the interim remedy. Finalizing the performance measures will resolve the approach for calculating mass loading of contaminants to the Mississippi River, controlling the pumping rates of the GMCS, and evaluating groundwater, surface water, and sediment data. Resolution of these issues will allow USEPA to determine if the remedy is functioning as intended.

### **Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?**

Yes. The assumptions and information on which the OU2 interim ROD was based are still valid. There have been no changes in the physical conditions at the site or in land use that would affect the protectiveness of the remedy. Currently, the methods for measuring the extent to which the current remedy is meeting the remedial action objective of protecting aquatic life are being reviewed. The OU2 interim ROD did not include measurable remediation goals for reduction of ecological risk. The issue is under discussion with the implementing PRPs and will be evaluated as part of the on-going supplemental RI/FS for the Sauget Area 2 site. The resolution of the issue will be documented in a decision document and appropriate site documents (e.g., the Remedial Action Completion report, the O&M Plan, and the final site-wide ROD).

#### **Changes in Standards and To-Be-Considered Requirements**

A list of ARARs is included in Attachment 9. Due to the limited scope of the interim remedy for OU2, USEPA invoked an interim action waiver of chemical-specific ARARs during finalization of the OU2 interim ROD. No changes in the location-specific or action-specific ARARs have been made, and no new standards or to be considered (TBC) requirements affecting the protectiveness of the remedy have been identified.

#### **Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics**

A human health risk assessment and ecological risk assessment are currently being developed as part of the remedial investigation of the Sauget Area 2 site, so the question of whether there have been any changes in exposure pathways, toxicity and other contaminant characteristics is not applicable.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. There has been no information, such as changes in land use or changes in site conditions, which would call into question the protectiveness of the remedy.

Technical Assessment Summary

The evaluation of whether the remedy is functioning as intended and whether the remedy is protective will be made once performance measures for the OU2 interim remedy are finalized and implemented. The performance measures include the control algorithm for the GMCS, the approach for calculating the mass loading of contaminants to the Mississippi River, and the evaluation method for groundwater, surface water, and sediment data. Approaches for the performance measures will be documented in a decision document and appropriate site documents (e.g., the Remedial Action Completion report, the O&M Plan, and the final site-wide ROD). A determination about long-term protectiveness will be made after the remedy selected in the site-wide ROD is implemented.

**VIII. ISSUES**

**Table 7. Issues**

<b>Issue</b>	<b>Currently Affects Protectiveness (Y/N)</b>	<b>Affects Future Protectiveness (Y/N)</b>
Although the GMCS is removing contaminant mass from the aquifer, performance measures for the OU2 interim remedy have not been finalized. Performance measures include the approaches for calculating mass loading to the Mississippi River, controlling the pumping rates across barrier wall to achieve a zero or inward gradient, and evaluating groundwater, surface water, and sediment data.	Unknown	Y

Other Issues Identified

Although current information suggests construction of the barrier wall and groundwater extraction system met standards, the Remedial Action Completion Report has not been finalized. Similarly, although current information suggests that the GMCS is functioning as intended, the O&M Plan has not been finalized. These two documents will be finalized in 2009.

## IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

**Table 8. Recommendations and Follow-Up Actions**

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Performance measures for the interim remedy, such as the methods for calculating mass loading to the Mississippi River, controlling the pumping rates across barrier wall to achieve a zero or inward gradient, and evaluating groundwater, surface water, and sediment data, have not been finalized.	Evaluate the performance measures as part of the on-going supplemental RI/FS.	Implementing PRPs	USEPA	Will be documented in a decision document and appropriate site documents such as the final site-wide ROD. The final site-wide ROD is currently scheduled to be completed in September 2009.	Unknown	Y

## X. PROTECTIVENESS STATEMENT

A protectiveness determination for the OU2 interim remedy (Site R) cannot be made until performance measures for the groundwater migration control system are developed and implemented. The performance measures will be developed and measured as part of the on-going supplemental RI/FS for the site. It is expected that these measures will be finalized by the end of December 2009, at which time a protectiveness determination will be made through an addendum to this five-year review. The performance measures will also be documented in a decision document and other appropriate site documents (e.g., the Remedial Action Completion Report, the O&M Plan, and/or the final site-wide ROD).

Although the protectiveness determination cannot be made at this time, the OU2 interim remedy is serving to reduce the mass loading of contaminants to the Mississippi River by removing and treating groundwater from the contaminated aquifers. In addition, access and informational controls limit the occurrence of recreational fishing in the vicinity of the site, and ordinances prohibiting groundwater use are in place for the majority of the site.

As discussed in the OU2 interim ROD, final remedial actions for groundwater and source areas will be addressed under a site-wide operable unit (OU1) decision document for Sauget Area 2 upon completion of the remedial investigation/feasibility study for the site. The actions

implemented under the OU2 interim ROD are consistent with the anticipated final remedy for the site. Long-term protectiveness will be achieved when the remedy selected in the site-wide ROD is implemented.

## **XI. NEXT REVIEW**

The next five-year review for Sauget Area 2 will be completed by June 2013.

## **ATTACHMENTS**

## **ATTACHMENT 1**

### **FIGURES**



# GROUNDWATER MIGRATION CONTROL SYSTEM

## AUTOMATED CONTROL AND MONITORING SYSTEM

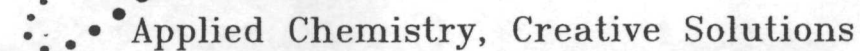
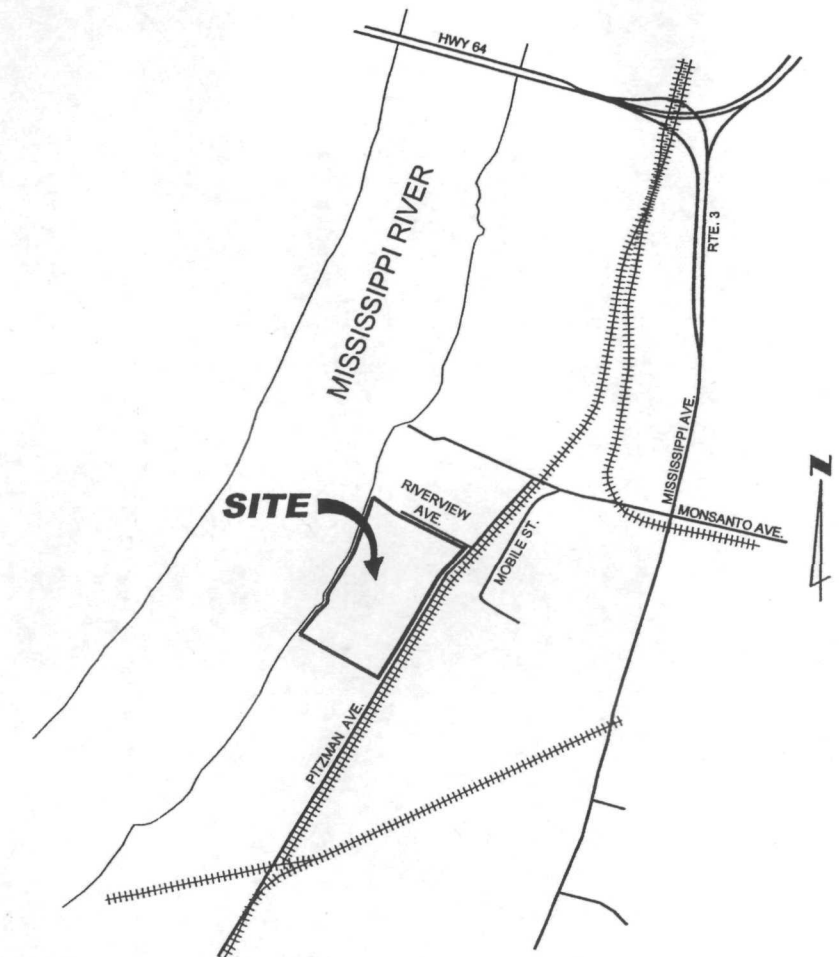
An aerial photograph of an industrial or urban area. A curved arrow points from the text 'SITE R' to a specific location on the shoreline of a body of water. The surrounding area includes various industrial structures, roads, and a dense grid of buildings in the lower-left corner.

Figure 1  
Sauget Area 2 Site  
Five-Year Review (2008)

File: P:\ENVIRONMENTAL\21562001.00003\DRAWINGS (4-11-08)\FIGURE 1-1 SITE LOCATION MAP.DWG Last edited: MAY 23, 08 @ 09:58 a.m. by: david\_dingle

<div>URS</div> <div>1001 Highlands Plaza Dr. West, Suite 300 St. Louis, MO 63110</div>				<div>THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS SHEET AND DISCLAIMS ANY RESPONSIBILITY FOR ALL OTHER DRAWINGS, SPECIFICATIONS, ESTIMATES, REPORTS, SURVEYS OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE PROFESSIONAL</div> <div>SEAL</div>		<div>DATE: 4/11/08</div> <div>SCALE:</div> <div>DESIGNED: RS</div> <div>DRAWN: DJD</div> <div>CHECKED:</div> <div>SUBMITTED:</div>		<div><div><div>SOLUTIA</div><div>Applied Chemistry, Creative Solutions</div></div><div>SOLUTIA INC. 575 MARYVILLE CENTRE DRIVE ST. LOUIS, MO. 63141</div></div>		<div>GROUNDWATER MIGRATION CONTROL SYSTEM</div> <div>FINAL REMEDIAL ACTION COMPLETION REPORT</div> <div>Site Location Map</div>		<div>PROJECT NO. 21562001</div> <div>FIGURE NO. 1-1</div>	
<div>NO.      DATE      REVISION      DESCRIPTION      APPROVED</div>													



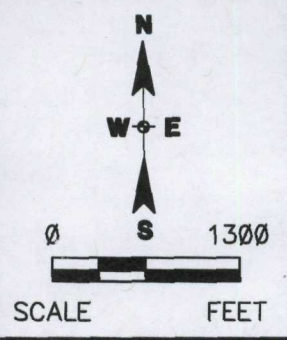
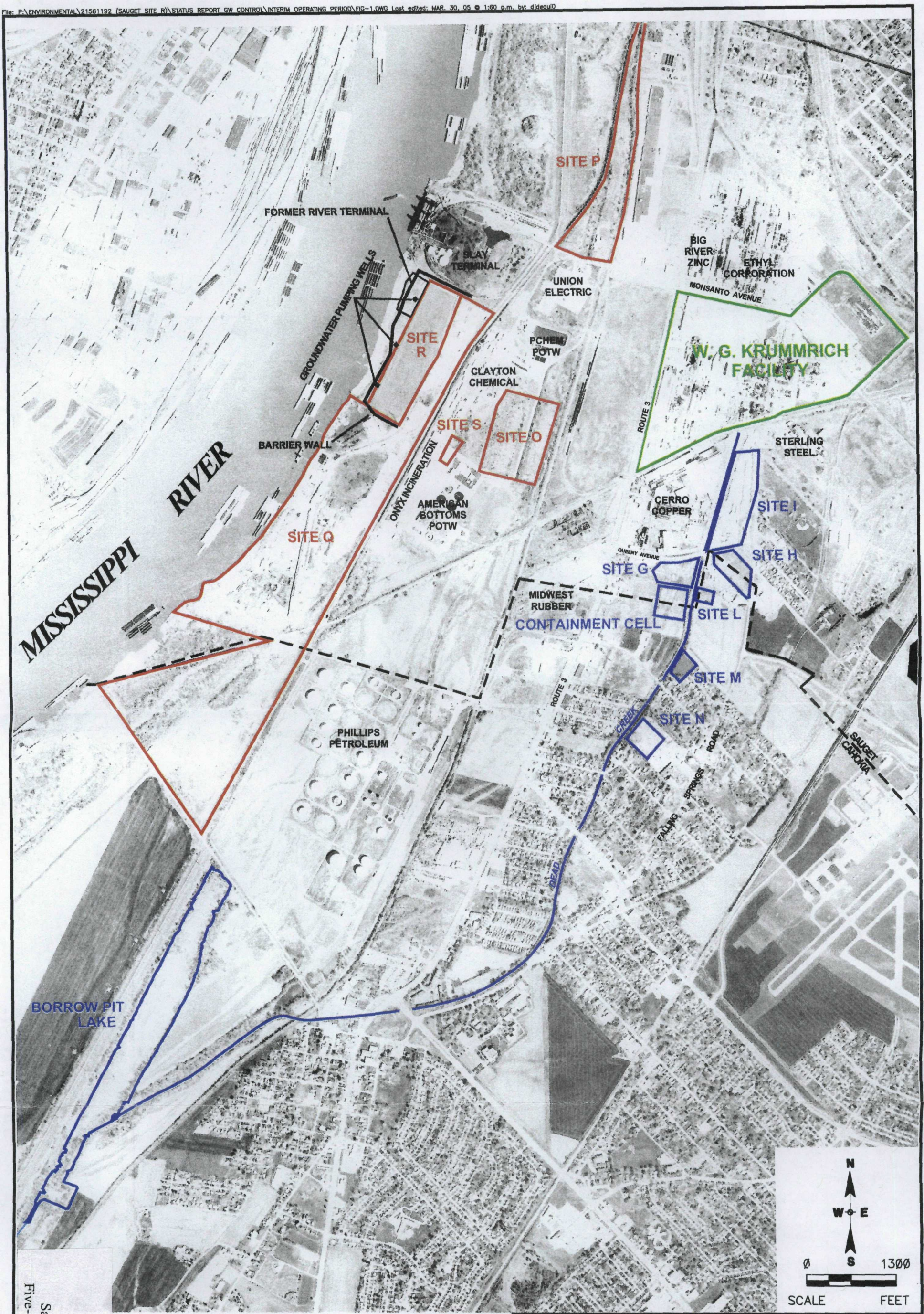
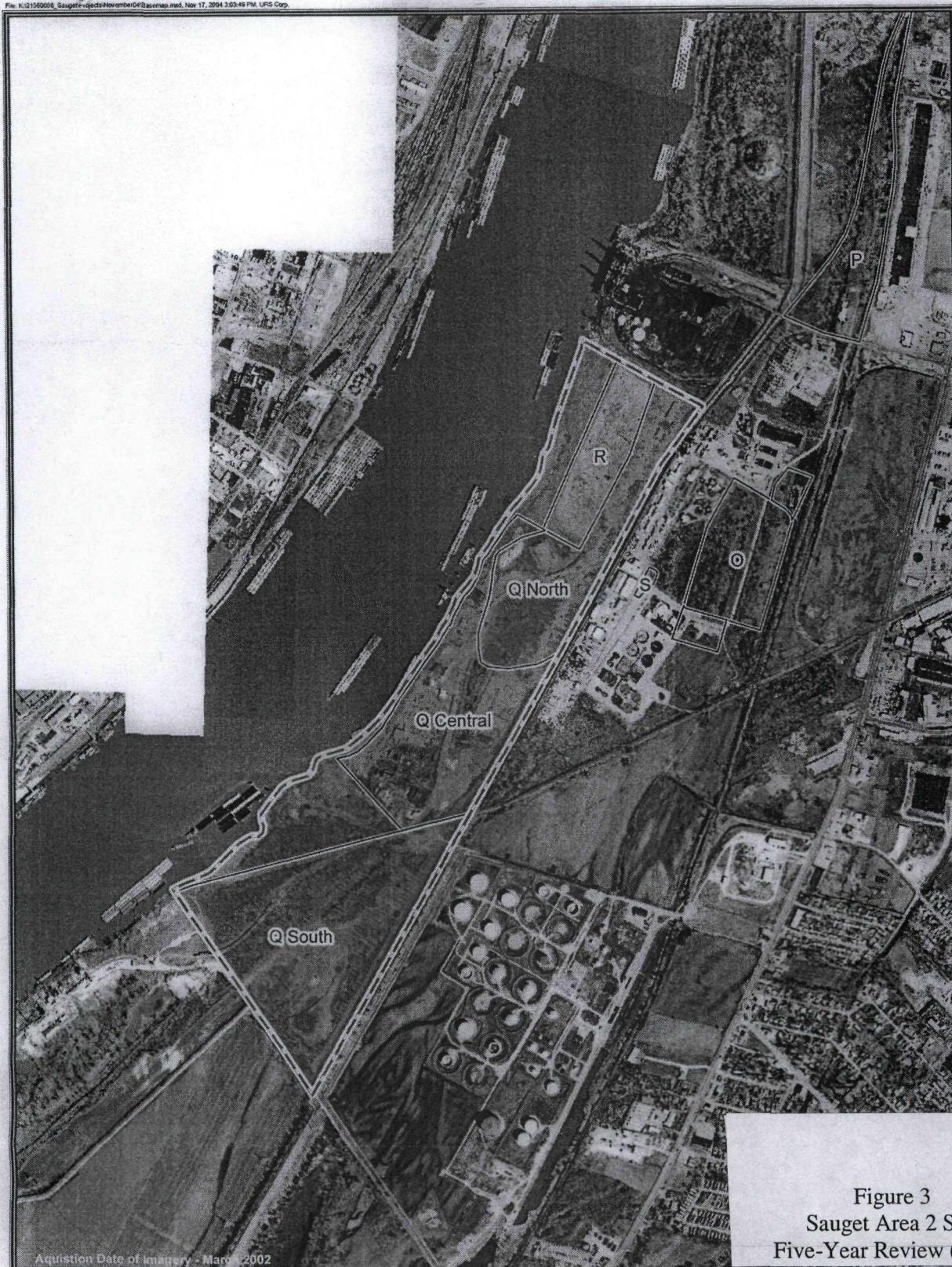


Figure 2  
Sauget Area 2 Site  
Five-Year Review (2008)

- LEGEND**
- W.G. KRUMMRICH FACILITY
  - SAUGET AREA #1
  - SAUGET AREA #2

INTERIM OPERATING PERIOD TECH MEMO GROUNDWATER MIGRATION CONTROL SYSTEM SAUGET AREA 2 SAUGET & CAHOKIA, ILLINOIS		PROJECT NO. 21561388.00000
<b>URS</b>		FIG. NO. 1
DRN. BY: djd 3/29/05 DSGN. BY: jg CHKD. BY:	Site Location Map	





Acquisition Date of imagery - March 2002

Figure 3  
Saugat Area 2 Site  
Five-Year Review (2008)

Stream Bank Boundary  
Date of Image

Study Extent  
100 Year Floodplain Boundary



0 500 1,000 2,000 Feet

1 inch equals 1,000 feet

**URS**

10975 El Monte, Suite 100  
Overland Park, KS 66211

SITE: SAUGAT, ILLINOIS

TITLE: 100 YEAR FLOODPLAIN BOUNDARY

DRAWN BY  
MKE

CHECKED BY  
KTS

APPROVED BY  
WPZ

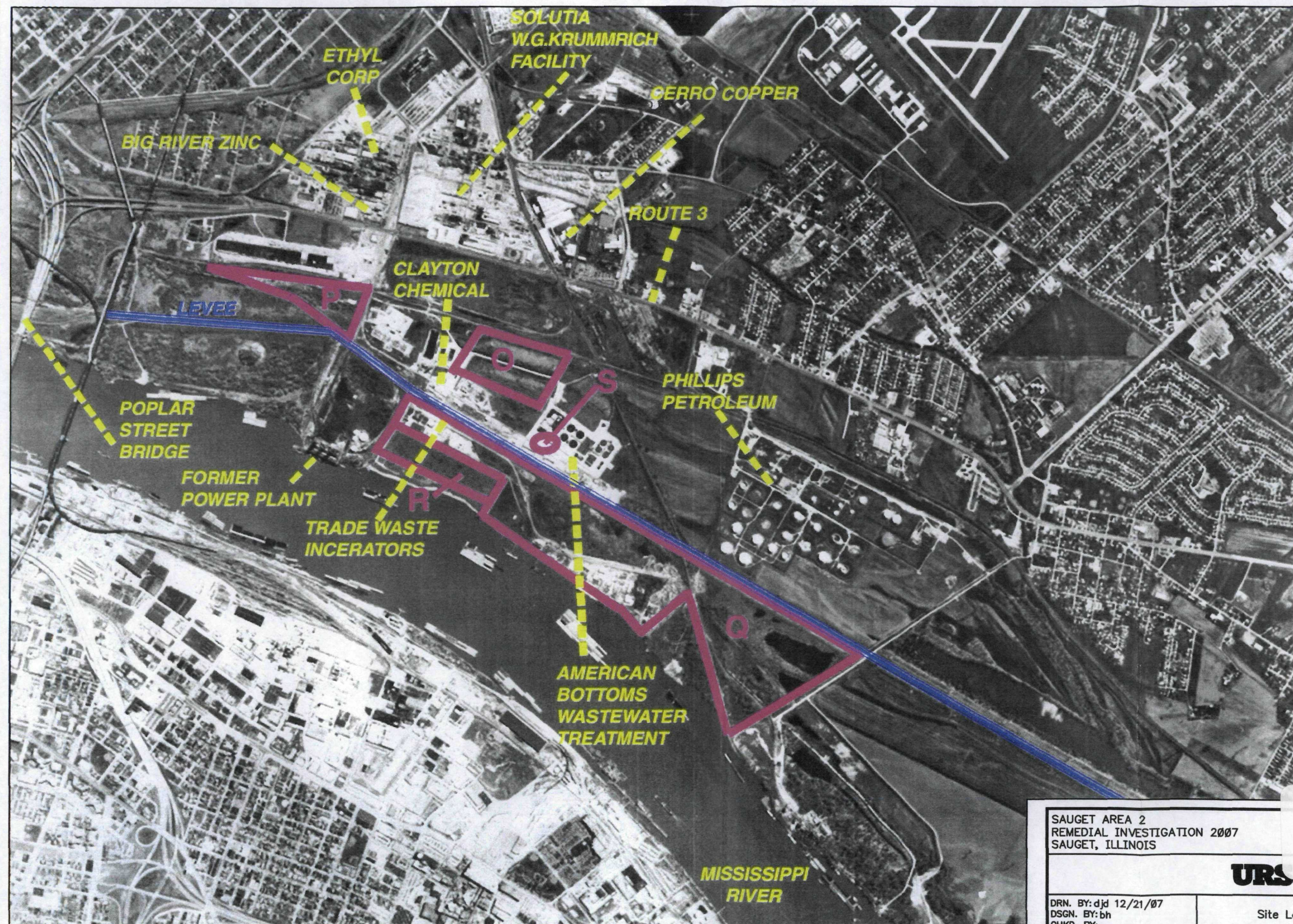
PROJECT No.

DATE  
November 17, 2004

FIGURE NO  
31 C



File: P:\ENVIRONMENTAL\21561510 (SA2)\DRAWINGS-FINAL REPORT\RI-FS 2007\FIG 4-1 SITE LOCATION (SITE).DWG Last edited: 12/19/07 @ 5:12 p.m. WC-ST LOUIS, MO



NOT TO SCALE

SAUGET AREA 2  
REMEDIAL INVESTIGATION 2007  
SAUGET, ILLINOIS

URS

DRN. BY: djd 12/21/07  
DSGN. BY: bh  
CHKD. BY:

Site Location Map

Figure 4  
Sauget Area 2 Site  
Five-Year Review (2008)

FIG. NO.  
4-1



File: P:\ENVIRONMENTAL\21561192 (SAUGET SITE R)\STATUS REPORT GW CONTROL INTERIM OPERATING PERIOD FIG-3.DWG Last edited: MAR. 30. 05 @ 1:53 p.m. by: djdequid

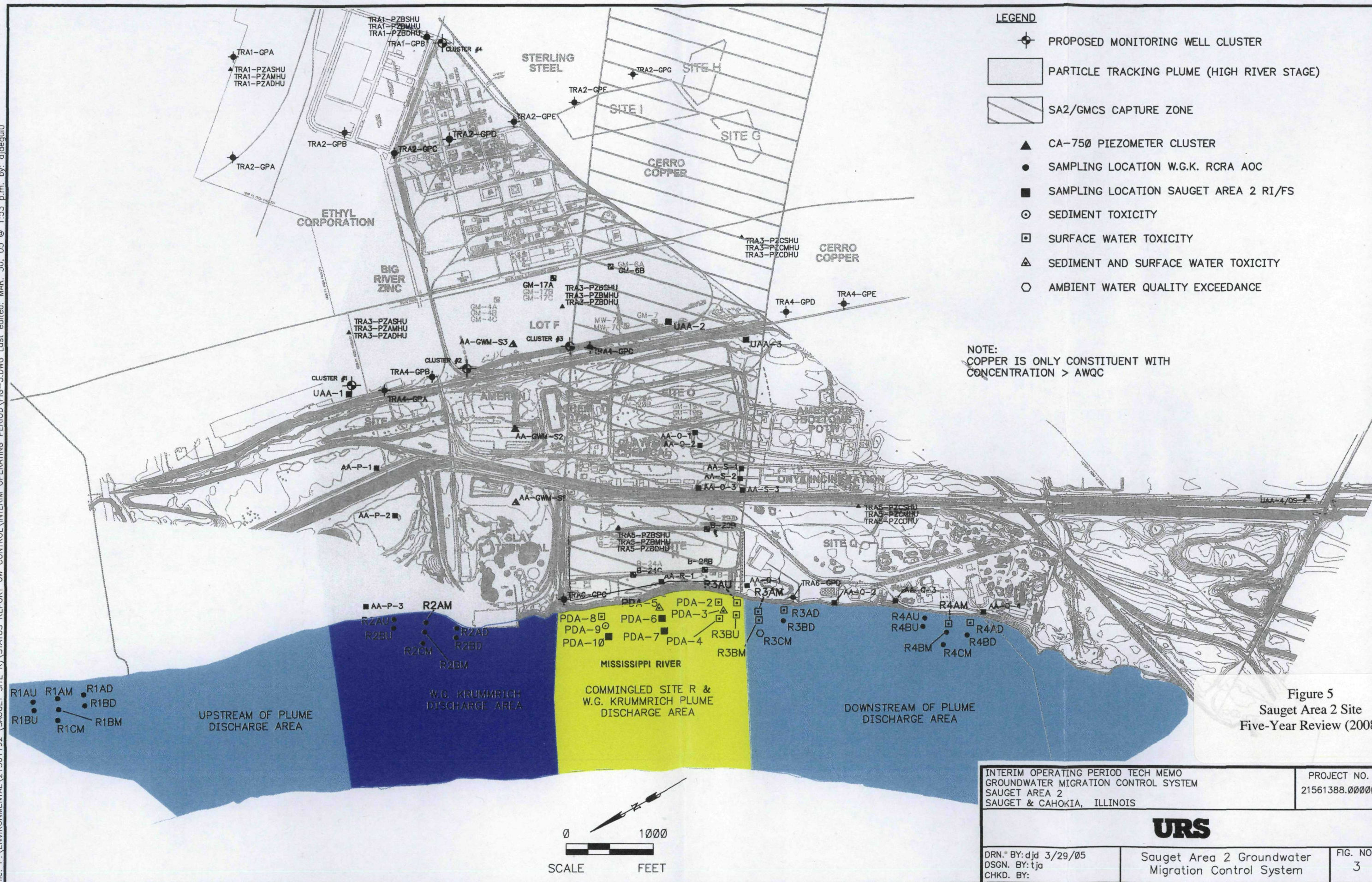
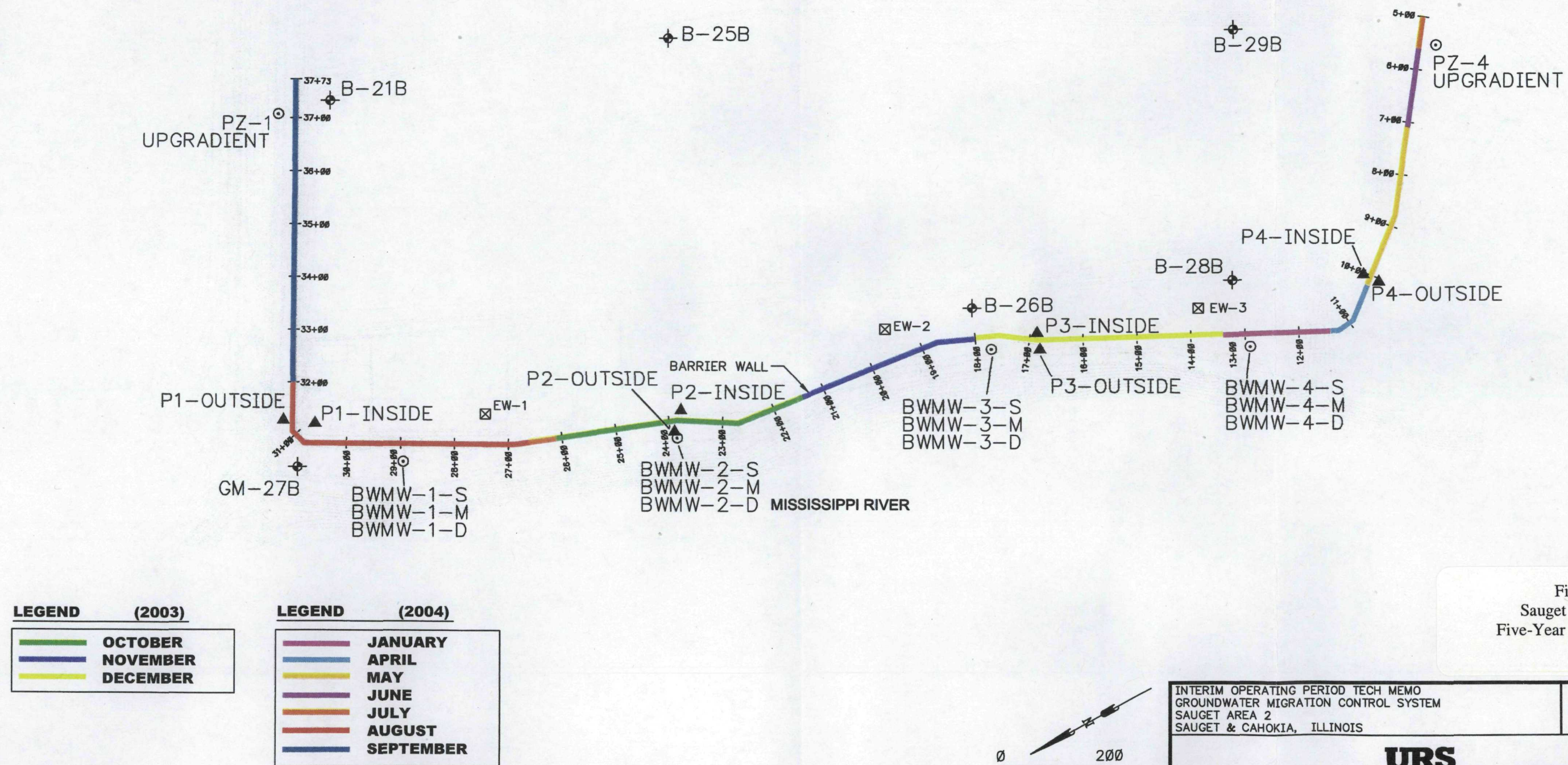


Figure 5  
Sauget Area 2 Site  
Five-Year Review (2008)

INTERIM OPERATING PERIOD TECH MEMO GROUNDWATER MIGRATION CONTROL SYSTEM SAUGET AREA 2 SAUGET & CAHOKIA, ILLINOIS		PROJECT NO. 21561388.00000
<b>URS</b>		
DRN. BY: djd 3/29/05 DSGN. BY: tja CHKD. BY:	Sauget Area 2 Groundwater Migration Control System	FIG. NO. 3



FILE: E:\PROJECTS\21561388\21561388.DWG (SAUGET SITE) STATUS: REPORT GW CONTROL/INTERIM OPERATING PERIOD/EC-2.DWG Laid out: 03/29/05 @ 1:58 p.m. WC-STLOUIS, MO



INTERIM OPERATING PERIOD TECH MEMO GROUNDWATER MIGRATION CONTROL SYSTEM SAUGET AREA 2 SAUGET & CAHOKIA, ILLINOIS		PROJECT NO. 21561388.00000
<b>URS</b>		
DRN. BY: djd 3/29/05 DSGN. BY: jg CHKD. BY:	Barrier Wall, Monitoring Well and Groundwater Level Location Map	FIG. NO. 2





Figure 7  
Sauget Area 2 Site  
Five-Year Review (2008)





Figure 8  
Sauget Area 2 Site  
Five-Year Review (2008)





Figure 9  
Sauget Area 2 Site  
Five-Year Review (2008)

## **ATTACHMENT 2**

ORDINANCE NO. *99-5*

## AN ORDINANCE PROHIBITING THE USE OF GROUNDWATER AS A POTABLE WATER SUPPLY BY THE INSTALLATION OR USE OF POTABLE WATER SUPPLY WELLS OR BY ANY OTHER METHOD

WHEREAS, certain properties in the Village of Sauget, Illinois, have been used over a period of time for commercial/industrial purposes; and

WHEREAS, because of said use, concentrations of certain chemical constituents in the groundwater beneath the Village may exceed Class I groundwater quality standards for potable resource groundwater, as set forth in 35 Illinois Administrative Code Part 620, or Tier 1 residential remediation objectives, as set forth in 35 Ill. Adm. Code Part 742; and

WHEREAS, the Village of Sauget desires to limit potential threats to human health from groundwater contamination while facilitating the redevelopment and productive use of properties that are the source of said chemical constituents;

NOW, THEREFORE, BE IT ORDAINED BY THE VILLAGE COUNCIL IN THE VILLAGE OF SAUGET, ILLINOIS:

Section One: Use of groundwater as a potable water supply prohibited.

The use or attempted use of groundwater from within the corporate limits of the Village as a potable water supply by the installation or drilling of wells or by any other method is hereby prohibited.

Section Two: Penalties

Any person violating the provisions of this ordinance shall be subject to a fine of up to *\$500* for each violation.

Section Three: Definitions.

"Person" is any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, or any other legal entity, or their representatives, agents or assigns.

"Potable water" is any water used for human or domestic consumption, including, but not limited to, water used for drinking, bathing, swimming, washing dishes, or preparing foods.

**Section Four: Repealer.**

All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed insofar as they are in conflict with this ordinance.

**Section Five: Severability.**

If any provision of this ordinance or its application to any person or under any circumstances is adjudged invalid, such adjudication shall not affect the validity of the ordinance as a whole or of any portion not adjudged invalid.

**Section Six: Effective Date.**

This ordinance shall be in full force and effect from and after its passage, approval and publication, as required by law.

**INTRODUCED AND READ FOR THE FIRST TIME:** October 12, 1999

**READ FOR THE SECOND TIME:**

(under suspension of rules): October 12, 1999

**READ FOR THE THIRD TIME:**

(under suspension of rules): October 12, 1999

**ADOPTED AND ENACTED:** October 12, 1999

**ROLL CALL VOTE:**

Ayes: Adele, McDaniel, Rich, Cates, Thornton, Saugert

Nays: NONE

Absent: NONE

Unfilled Vacancy:

**APPROVED:** October 12, 1999

**APPROVED:**

Paul Auger  
President (mayor) Pro Tempore

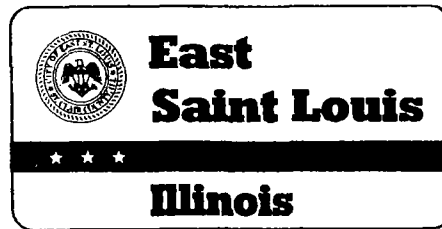
**ATTEST:**

Betty Long Wilson  
Village Clerk

RECEIVED

FEB 5 1998

IEPA/BOL



## CITY CLERK'S CERTIFICATE

**STATE OF ILLINOIS,  
ST. CLAIR COUNTY  
CITY OF EAST ST. LOUIS,**

I, Alzada Christian-Carr

CITY CLERK FOR THE CITY OF EAST ST. LOUIS, ILLINOIS, DO HEREBY CERTIFY THAT THE ABOVE AND FOREGOING IS A TRUE AND CORRECT COPY OF \_\_\_\_\_

An Ordinance prohibiting the use of Groundwater as a potable water supply; instituted to protect the safety, health and welfare of local residents and provide protective covenants to facilitate the redevelopment and re-use of property in the City of East St. Louis

PASSED: November 13, 1997 By The Board of Councilmen and Mayor Gordon D. Bush

And I Further Certify That the Original \_\_\_\_\_

Ordinance

Of Which The Foregoing Is A Certified Copy, Is By Law Intrusted To My Custody For Safe Keeping, And Is On File In My Office.

WITNESS My Hand And The Corporate Seal Of Said City,

This 3rd Day of February A.D. 19 98

Alzada Christian Carr

City Clerk Of East St. Louis, Illinois

**ORDINANCE # 97 - 10066**

**AN ORDINANCE PROHIBITING THE USE OF GROUNDWATER AS A POTABLE WATER SUPPLY; INSTITUTED TO PROTECT THE SAFETY, HEALTH AND WELFARE OF LOCAL RESIDENTS AND PROVIDE PROTECTIVE COVENANTS TO FACILITATE THE REDEVELOPMENT AND RE-USE OF PROPERTY IN THE CITY OF EAST ST. LOUIS.**

**WHEREAS:** the City of East St. Louis, St. Clair County, Illinois (the 'City'), is a duly created, organized and validly existing municipality of the State of Illinois under the 1970 Illinois Constitution (the 'Constitution') and the laws of the State of Illinois, including particularly the Illinois Municipal Code, and all laws amendatory thereof and supplementary thereto (*Chapter 65, Act 5, Illinois Compiled Statutes (1994)*); the 'Code'; and

**WHEREAS:** the City is a 'home rule unit' under Section 6(a) of Article VII of the Constitution and, as such, may exercise any power or perform any function pertaining to its government and affairs including, but not limited to, the power to tax and the power to incur debt, and the power to protect the health and promote the welfare of its citizens; and

**WHEREAS:** The City of East St. Louis may enter into a Redevelopment Plan and Planed Units Development Agreement that may be made a part of this Ordinance by reference.

**Section One. Use of groundwater as a potable supply prohibited.**

**EXCEPT FOR SUCH USES OR METHODS IN EXISTENCE BEFORE THE EFFECTIVE DATE OF THIS ORDINANCE, The use or an attempt to use as a potable water supply, groundwater from within the corporate limits of the City of East St. Louis by the installation or drilling of wells or by any other methods is hereby prohibited.**

**Section two. Penalties.**

Any person violating the provisions of this ordinance shall be subject to a fine of up to five hundred dollars (\$500.00) for each violation.

**Section three. Definitions.**

□Persons□ is any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, or any entity, or their legal representative, agents or assigns.

□Potable water□ is any water used for human or domestic consumption, including, but not limited to, water used for drinking, bathing, swimming, washing dishes, or preparing foods.

**Section four. Repealer.**

All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed insofar as they are in conflict with this ordinance.

**Section five. Severability.**

If any provision of this ordinance or its application to any person or under any circumstances is adjudged invalid, such adjudication shall not effect the validity of the ordinance as a whole or any portion not adjudged invalid

**Section six. Effective date.**

This ordinance shall be in full force and effect upon passage, approval and publication as required by law.

The City Council of the City of East St. Louis herein authorizes the Mayor and or City Manager to implement and sign any and all corresponding and necessary government regulatory documents to implement this □Ground Water Safety and Public Health Protection Ordinance, herein passed; via any and all necessary Memorandum of Understandings (MOU) already passed by City Council or deemed to be



necessary by and between the City of East St. Louis and the appropriate and or necessary Environmental Protection Agencies (i. e. The Illinois Environmental Protection Agency, IEPA; the United States Environmental Protection Agency including U. S. EPA Region V; and or the State of Illinois Department of Natural Resources (DNR), and or appropriate County Agencies and/or the Financial Advisory Authority, including the proper recording and posting of any and all material concerning this Ordinance and those Agreements and Memorandum of Understandings (MOU's) affecting this Ordinance.

BY:



GORDON D. BUSH, MAYOR

Date

SIGNED:

November 13, 1997

PASSED:

November 12, 1997

FILED:

RECORDED:

ATTEST:



ALZADA C. CARR, CITY CLERK



## **Explanatory Statement - Ordinance prohibiting the use of groundwater as a potable water supply (Union Bank Project)**

---

The following is a brief description of why a Groundwater Ordinance is needed, why it has been modified, and where we are with the groundwater problem in Metro-East St. Louis, and specifically at the Union Bank site.

The City has groundwater contamination; any infiltration into the groundwater from specific contaminated soil exacerbate the problem. The state will not allow such conditions to exist for selected contaminants.

The problem. . . when the City seeks to redevelop and reuse its commercial and industrial sites, odds are some form of contaminate may likely exist. We housed many polluters of yesterday. Keep in mind, even old highway routes from the era of leaded automotive gasoline users, spewing contaminants onto the ground adjacent and along the right-of-way. This oftentimes resulted in (*Lead contaminated sites*).

Other sites in our City may actually have been leaden with night dumping and manufacturers who processed products no longer tolerable. To reuse this land, '*someone*' must comply with all federal, state and local regulations pertaining to any contaminants above Tier I level, if the site is to be reused and/or revitalized in accordance with current law.

The mechanism available in the State of Illinois for site remediation/reuse and redevelopment of Brownfields where actual contaminants exist, is to comply with the State of Illinois EPA Voluntary Clean-up Program and site remediation. This is the process the City selected, the re-utilization of the Union Bank Drive-up/Office Complex site. The guidelines call for several safeguards: Clean up and removal of contaminants; engineered barrier, mechanisms put in place to prevent any further contamination; institutional controls, etc.

This Groundwater Ordinance is an Institutional Control required by the IEPA. It was approved by our City Council in the form IEPA dictated and required verbatim. However, another important IEPA entity made revisions, that he said is also required.

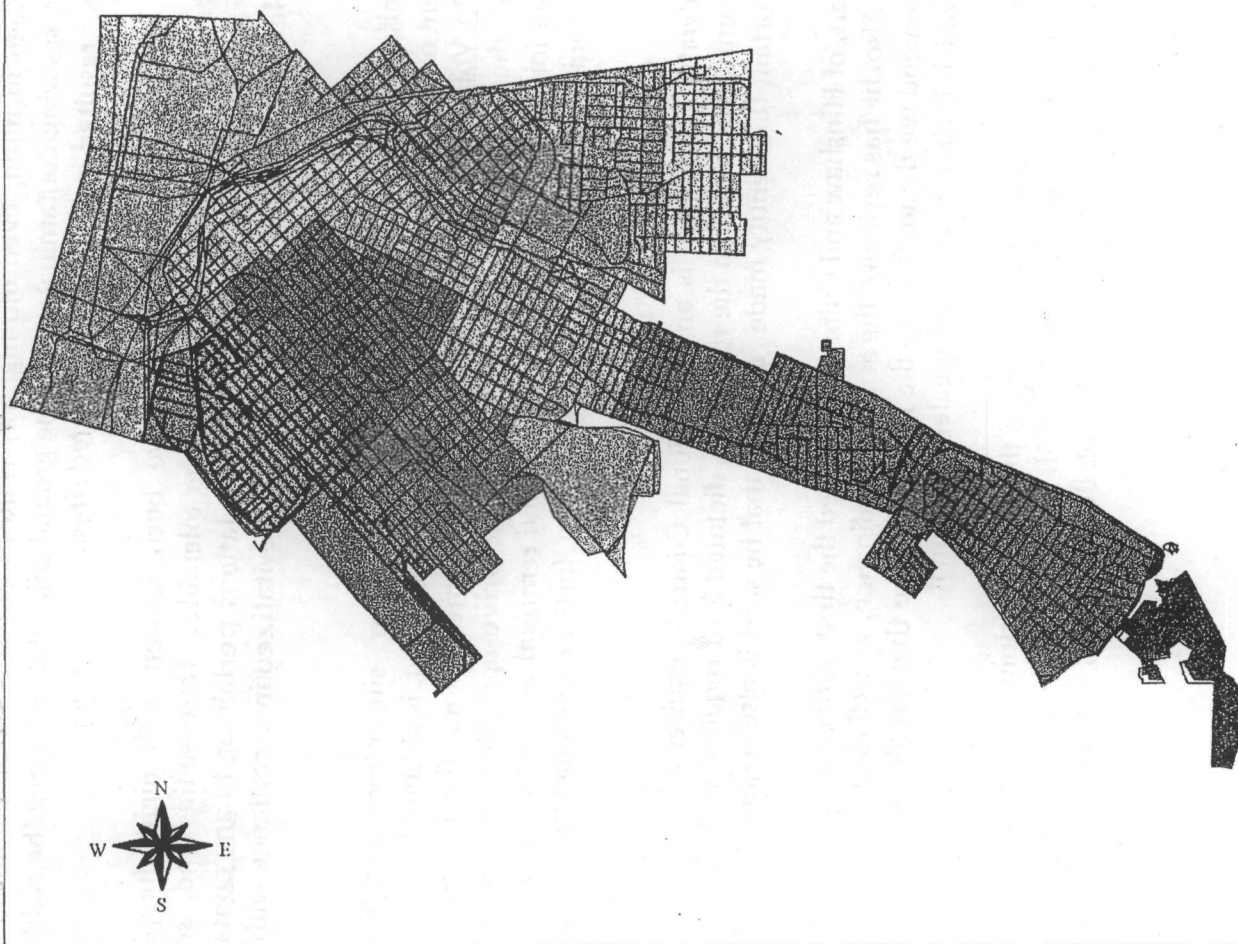
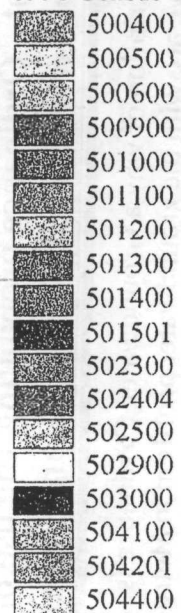
Terry Bruckert, of Hinshaw and Culbertson, revised the first 'Ordinance' that was approved by Council. Also, he has reviewed the attached Ordinance, as well as the one for CH2MHill. I don't recommend we do anything to the first Ordinance that has already been passed. If in conflict, which it isn't, there is a repealer clause in it.

Once this Ordinance is passed, we will need the Memorandum of Understanding (MOU) by and between the IEPA and the City of East St. Louis. I have suggested it be in a Planned Units Development (PUD) for the Union Bank development, in order to cover the process properly.

# City of East St. Louis

## *City Boundary Map*

Streets.shp  
1990 Census Tract.shp



Prepared  
by  
CDBG Operations Corporation

June 1998

MEMORANDUM OF UNDERSTANDING BETWEEN CITY OF E. ST. LOUIS, IL.  
AND THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY REGARDING THE  
USE OF A LOCAL GROUNDWATER OR WATER WELL ORDINANCE AS AN  
ENVIRONMENTAL INSTITUTIONAL CONTROL

I. PURPOSE AND INTENT

- A. This Memorandum of Understanding ("MOU") between CITY OF E. ST. LOUIS, IL. and the Illinois Environmental Protection Agency ("Illinois EPA") is entered into for the purpose of satisfying the requirements of 35 Ill. Adm. Code 742.1015 for the use of groundwater or water well ordinances as environmental institutional controls. The Illinois EPA has reviewed the groundwater or water well ordinance of the City of EAST ST. LOUIS, IL. (Attachment A) and determined that the ordinance prohibits the use of groundwater for potable purposes and/or the installation and use of new potable water supply wells by private entities but does not expressly prohibit those activities by the unit of local government itself. In such cases, 35 Ill. Adm. Code 742.1015(a) provides that the unit of local government may enter into an MOU with the Illinois EPA to allow the use of the ordinance as an institutional control.
- B. The intent of this Memorandum of Understanding is to specify the responsibilities that must be assumed by the unit of local government to satisfy the requirements for MOUs as set forth at 35 Ill. Adm. Code 742.1015(i).

II. DECLARATIONS AND ASSUMPTION OF RESPONSIBILITY

In order to ensure the long-term integrity of the groundwater or water well ordinance as an environmental institutional control and that risk to human health and the environment from contamination left in place in reliance on the groundwater or water well ordinance is effectively managed, EAST SAINT LOUIS hereby assumes the following responsibilities pursuant to 35 Ill. Adm. Code 742.1015(i):

- A. EAST SAINT LOUIS will notify the Illinois EPA Bureau of Land of any proposed ordinance changes or requests for variance at least 30 days prior to the date the local government is scheduled to take action on the proposed change or request (35 Ill. Adm. Code 742.1015(i)(4));
- B. EAST SAINT LOUIS will maintain a registry of all sites within its corporate limits that have received "No Further Remediation" determinations from the Illinois EPA (35 Ill. Adm. Code 742.1015(i)(5));
- C. EAST SAINT LOUIS will review the registry of sites established under paragraph II. B. prior to siting public potable water supply wells within the area covered

**RELEASABLE**

JAN 23 2001

**REVIEWER MM**

by the ordinance (35 Ill. Adm. Code 742.1015(i)(6)(A));

- D. EAST SAINT LOUIS will determine whether the potential source of potable water has been or may be affected by contamination left in place at the sites tracked and reviewed under paragraphs II. B. and C. (35 Ill. Adm. Code 742.1015(i)(6)(B)); and
- E. EAST SAINT LOUIS will take action as necessary to ensure that the potential source of potable water is protected from contamination or treated before it is used as a potable water supply (35 Ill. Adm. Code 742.1015(i)(6)(C)).

NOTE: Notification under paragraph II. A. above or other communications concerning this MOU should be directed to:

Manager, Division of Remediation Management  
Bureau of Land  
Illinois Environmental Protection Agency  
P.O. Box 19276  
Springfield, IL 62794-9276

### III. SUPPORTING DOCUMENTATION

The following documentation is required by 35 Ill. Adm. Code 742.1015(i) and is attached to this MOU:

- A. Attachment A: A copy of the groundwater or water well ordinance certified by the city clerk or other official as the current, controlling law (35 Ill. Adm. Code 742.1015(i)(3));
- B. Attachment B: Identification of the legal boundaries within which the ordinance is applicable (certification by city clerk or other official that the ordinance is applicable everywhere within the corporate limits; if ordinance is not applicable throughout the entire city or village, legal description and map of area showing sufficient detail to determine where ordinance is applicable) (35 Ill. Adm. Code 742.1015(i)(2));
- C. Attachment C: A statement of the authority of the unit of local government to enter into the MOU (council resolution, code of ordinances, inherent powers of mayor or other official signing MOU – attach copies) (35 Ill. Adm. Code 742.1015(i)(1)).

IN WITNESS WHEREOF, the lawful representatives of the parties have caused this MOU to be signed as follows:

FOR: CITY OF EAST SAINT LOUIS, ILLINOIS  
(Name of city or village)

BY: Gordon W. Bush MAYOR  
(Name and title of signatory)

DATE: MAY 19, 1998

FOR: Illinois Environmental Protection Agency

BY: Gary P. King Manager,  
(Name and title of signatory) Division of  
Remediation  
Management

DATE: June 29, 1998

## **ATTACHMENT 3**

ATTACHMENT B  
SUMMARY TABLE OF WELL SCREEN INTERVALS  
Site R Sauget, Illinois

WELL / PIEZOMETER ID	SCREENED INTERVAL (ft. BGS)
BWMW-1S	35 - 45
BWMW-1M	70 - 80
BWMW-1D	110 - 120
BWMW-2S	30 - 40
BWMW-2M	74.5 - 84.5
BWMW-2D	119 - 129
BWMW-3S	25 - 35
BWMW-3M	74 - 84
BWMW-3D	121.5 - 131.5
BWMW-4S	25 - 35
BWMW-4M	70 - 80
BWMW-4D	119.5 - 129.5
P1-N	57 - 132
P1-S	55 - 130
P2-E	54 - 129
P2-W	52 - 127
P3-E	54 - 139
P3-W	52.5 - 137.5
P4-E	52.5 - 132.5
P4-W	52.5 - 132.5
EW-1	53 - 136.2
EW-2	41.5 - 110
EW-3	56.5 - 131.3

Notes:

ft. BGS - feet below ground surface

## **ATTACHMENT 4**



# Illinois Fish and Your Health

## A Guide to Your Health

Fish are nutritious, but some fish contain chemicals such as polychlorinated biphenyls (PCBs), chlordane and methyl mercury. These chemicals get into the water fish live in and the food they eat, and over time they can build up to levels that may cause health effects in people who eat the fish. It is important to keep exposure to these chemicals as low as possible. The Illinois fish advisory helps you plan what sport fish to eat as well as how often they can be eaten. *The fish advisory is not intended to discourage you from eating fish, but should be used as a guide to eating fish that are low in contaminants.*

## Statewide Methyl Mercury Advisory

Since 2002, the Illinois sport fish meal advice has been presented in an expanded format. Previously, advisories based on all contaminants in fish were found in one table. Due to a more restrictive approach for methyl mercury in fish, a general state-wide advisory for predator fish is needed for women of childbearing age and children. In addition, a second table lists those waters where stricter advice for methyl mercury is necessary. **This does not mean that fish have become more contaminated with methyl mercury, only that recent studies have shown that methyl mercury is more toxic than previously thought.**

## Health Benefits of Eating More Fish

Eating fish is good for you! When properly prepared, fish provide many health benefits. Many doctors suggest eating one-half pound of fish each week to help prevent heart disease. In fact, the American Heart Association recommends eating two to three fish meals per week. The benefits of eating fish include:

- Almost any kind of fish may have **real health benefits** when it replaces a high-fat source of protein in the diet. Possible health effects associated with high-fat diets include heart disease, high blood pressure, diabetes, and several forms of cancer.
- Fish offer **high-quality protein with fewer calories** than a similar-sized portion of meat. For example, both catfish and ground beef are about 18% protein. However, an 8-ounce meal of the catfish will have only about 232 calories, while the regular ground beef will have about 640 calories.
- Freshwater and saltwater fish alike are both **low in sodium and good sources of potassium, vitamins, and other minerals.**
- Fish are generally **low in cholesterol and saturated fats**, which have been associated with high blood pressure and heart disease. Eating fish regularly may lower the levels of cholesterol and saturated fats in your body.
- Scientific research has revealed beneficial roles of certain fish oils in nutrition and general health. While the benefits of fish on nutrition are still being studied, much of the current research is focused on various kinds of beneficial fats in fish, particularly a kind called omega-3 fatty acids, which are in some fish and fish oils. Some studies have indicated that these fatty acids play an important role in fetal development, and also have favorable effects on health conditions such as hardening of the arteries (atherosclerosis), high levels of cholesterol, high blood pressure, and perhaps even arthritis. Note that atherosclerosis, high blood pressure, and obesity are the three major diet-related factors which increase the risk of developing coronary heart disease the cause of nearly half of all deaths in the United States today. Also, one in five Americans has a problem with atherosclerosis or high blood pressure.

## Health Risks

Eating contaminated fish does **not** necessarily mean that you will experience health effects. The health problems that **may** result from chemicals that can build up in fish range from small changes that are hard to detect to birth defects and cancer. The most sensitive of these possible health effects are small changes in infant measurements, such as low birth weights (caused by PCBs), and small changes in the normal physical or mental development of infants and children (caused by PCBs, chlordane, and methyl mercury). Therefore, the meal advice contained in the following tables is primarily aimed at protecting mothers and their children.

If you follow the guidance of the fish advisories, you will keep exposure to these chemicals low for both you and your children.

## Cleaning and Cooking

Many chemicals are found at higher levels in the fat of the fish. You can reduce the amount of these chemicals and your exposure by properly trimming, skinning and cooking your catch. **Cooking does not destroy chemicals in fish**, but heat from cooking melts some of the fat in fish and allows some of the contaminated fat to drip away. Do not use the drippings to prepare broth, sauce, chowder or soup. **These cleaning precautions will not reduce the amount of mercury in fish.** Mercury is found throughout a fish's muscle tissue (the part you eat) rather than in the fat and skin. Therefore, the only way to reduce mercury intake is to reduce the amount of contaminated fish you eat.

## Methyl Mercury

Mercury is found in the environment because of natural and human activities. When moving through the environment, mercury goes through a series of complex changes. Through these changes in lake and river sediments, an organic form of mercury, methyl mercury, is created. Methyl mercury is very persistent in the environment. Methyl mercury is transferred up the food chain to predator species, and can accumulate in people that eat these predator fish.

Methyl mercury is extremely toxic to humans and causes many adverse health effects. Health effects associated with eating methyl mercury-contaminated fish include impaired central nervous system function, kidney damage and failure, and gastrointestinal damage with higher methyl mercury exposure, and development delays in children with lower exposure. A recent report by the National Academy of Sciences concluded that the population at highest risk for adverse health effects is the children of women who eat large amounts of fish and seafood during pregnancy. This is due to the greater sensitivity of the developing nervous system of infants.

**In order to protect the most sensitive populations, pregnant or nursing women, women of childbearing age, and children less than 15 years of age are advised to eat no more than one meal per week of predator fish.**

This advisory is based on recent studies of families in several countries that eat many meals of fish having various amounts of methyl mercury, along with the most recent mercury data from predator fish at sample points throughout the state. Predator fish include all species of black bass (largemouth, smallmouth, and spotted), striped bass, white bass, hybrid striped bass, walleye, sauger, saugeye, flathead catfish, muskellunge, and northern pike. **Since women beyond childbearing age and males over 15 years of age are at less risk for the effects of methyl mercury, these groups may continue to enjoy as many meals of predator fish as they please, except as noted below.**

## Meal Advice for Eating Sport Fish From Illinois Waters

- Measure fish from the tip of the nose to the tip of the tail.

- **One meal a week (52 meals per year), one meal a month (12 meals per year) and one meal every two months (six meals per year)** is advice for how long to wait before eating your next meal of sport fish.

- **Do not eat** means no one should eat those fish because of very high contamination. (Note that the amount of contamination in a fish listed on the "One meal a month" group is four times higher than the amount of contamination in a fish listed in the "One meal a week" group.)

- **One "meal"** is assumed to be one-half pound of fish (weight before cooking) for a 150-pound person. The meal advice is equally protective for larger people who eat larger meals and smaller meals.

- Follow cooking and cleaning directions given above to prepare fish.



## Special Mercury Advisory

A few bodies of water have been found to have fish with higher levels of methyl mercury than in waters from the rest of the state. These waters require more restrictive meal advice than the general advice given above. The special advice is listed in the following table.

Water	Fish Species	Women, beyond childbearing age, males more than 15 years old	Pregnant or nursing women, women of childbearing age, children less than 15 years old
Ohio River	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Rock River (Rockford to Milan Steel Dam)	Flat head Catfish (larger than 29")	1 meal/week	1 meal/month
Arrowhead Lake (Cook County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Campus Lake (Southern IL Univ.)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Cedar Lake (Jackson County)	Largemouth Bass (larger than 12")	1 meal/week	1 meal/month
	White Crappie (all sizes)	unlimited	1 meal/week
Devil's Kitchen Lake (Williamson County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
	Black Crappie (all sizes)	1 meal/week	1 meal/month
Evergreen Lake * (McLean County)	Largemouth Bass (Larger than 19")	1 meal/week	1 meal/month
Kinkaid Lake (Jackson County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
	Walleye (all sizes)	1 meal/week	1 meal/month
	White Crappie (all sizes)	unlimited	1 meal/week
Lake Bracken (Knox County)	Largemouth Bass (larger than 17")	1 meal/week	1 meal/month
Lake in the Hills (McHenry County)	Largemouth Bass (larger than 15")	1 meal/week	1 meal/month
Little Grassy Lake (Williamson County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
	White & Black Crappie (all sizes)	unlimited	1 meal/week
Mt. Olive New City Lake* (Macoupin County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Little Wabash River & Tributaries	Carp (all sizes)	1 meal/week	1 meal/month
	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
	Spotted Bass (all sizes)	1 meal/week	1 meal/month
	White Crappie (all sizes)	unlimited	1 meal/week
Marquette Park Lagoon (Cook County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Midlothian Reservoir (Cook County)	Largemouth Bass (larger than 14")	1 meal/week	1 meal/month
Monee Reservoir (Will County)	Largemouth Bass (all sizes)	1 meal/week	1 meal/month
Wabash River	Sauger (larger than 12")	1 meal/week	1 meal/month



## Chlordane and PCB Advisory

The following fish advisory is for eating trimmed and skinned fish (except smelt). The advice in this table has been developed to protect infants, children and women of child bearing age. The advice may be over protective for women beyond child bearing age and adult men.

Water	Fish Species	1 meal/week	1 meal/month	6 meals/year	Do Not Eat
<b><u>BORDER WATERS</u></b>					
<b>Lake Michigan (P)</b>	Chinook Salmon*		Less than 36"	Larger than 36"	
	Coho Salmon		All Sizes		
	Lake Whitefish		All Sizes		
	Rainbow Trout	Less than 22"	Larger than 22"		
	<b>Brown Trout*</b>		<b>Less than 25"</b>	<b>Larger than 25"</b>	
	Lake Trout		Less than 23"	23" to 27"	Larger than 27"
	Yellow Perch	All Sizes			
	Smelt	All Sizes			
	Channel Catfish				All Sizes
<b>Waukegan North Harbor (P)</b> (Includes all species listed above as well as):	Carp				All Sizes
	White Sucker		All Sizes		
<b>Mississippi River (P)</b> Entire River	Sunfish		All Sizes		
	Channel Catfish	Less than 18"	Larger than 18"		
	Entire River Except Pool 15	Carp	All Sizes		
	Pool 15	Carp	All Sizes		
	Lock and Dam 22 to Cairo	Sturgeon	All Sizes		
<b>Ohio River (P)</b>	Channel Catfish	Larger 15"			
	Blue Catfish	All Sizes			
	Carp		All Sizes		
	Drum	Less than 14"	Larger than 14"		
	Sauger		All Sizes		
	Largemouth Bass		See Special Mercury Advisory		
<b>Wabash River (P)</b>	Carp	All Sizes			
	Channel Catfish	Larger than 19"			
	Drum	All Sizes			
	White Bass		All Sizes		
<b><u>LAKES</u></b>					
<b>Busse Lake (P)</b>	Carp		All Sizes		
	Black Bullhead	All Sizes			
	Channel Catfish	All Sizes			
<b>Campus Lake (P)</b> (Southern IL Univ.)	Bluegill	All Sizes			
	Largemouth Bass		See Special Mercury Advisory		
<b>Crab Orchard Lake (P)</b>					
East of Wolf Creek Road	Largemouth Bass	All Sizes			
	Channel Catfish		All Sizes		
	Carp		All Sizes		
West of Wolf Creek Road	Largemouth Bass	All Sizes			
	Channel Catfish		All Sizes		
	Carp	All Sizes			
<b>Fox Chain-O-Lakes (P)</b>	Channel Catfish	Larger than 18"			
	Carp		All Sizes		
<b>Frank Holten State Lakes (P)</b>	Largemouth Bass	Larger than 14"			
	Channel Catfish	All Sizes			
<b>Herrin Lake #1 (P)</b>	Carp				All Sizes
	Channel Catfish		All Sizes		
<b>Highland-Silver Lake (C)</b>	Channel Catfish	Larger than 25"			



Water	Fish Species	1 meal/week	1 meal/month	6 meals/year	Do Not Eat
<b>LAKES</b>					
<b>Horseshoe Lake (P) (Madison County)</b>	Carp	All Sizes			
	Channel Catfish	Less than 20"	Larger than 20"		
<b>Lake Bracken (P) (Knox County)</b>	Largemouth Bass	All Sizes			
	Channel Catfish	Less than 15"	Larger than 15"		
	Carp		All Sizes		
	Largemouth Bass		See Special Mercury Advisory		
<b>Lake Calumet (P)</b>	Largemouth Bass	Less than 14"	Larger than 14"		
	Carp		All Sizes		
<b>Lake Decatur (P,C)</b>	Channel Catfish	All Sizes			
	Carp	All Sizes			
	Flathead Catfish		All Sizes		
<b>Lake Depue (P)</b>	Channel Catfish			Less than 24"	Larger than 24"
	Carp		All Sizes		
<b>Lake of Egypt (P)</b>	Carp	Larger than 23"			
	Channel Catfish	Larger than 20"			
<b>Lake Taylorville (C)</b>	Channel Catfish	All Sizes			
<b>Marion City Reservoir (P)</b>	Carp		All Sizes		
<b>Midlothian Reservoir (P)</b>	Carp	Less than 20"	Larger than 20"		
<b>Powerton Lake (P)</b>	Channel Catfish	15" to 19"	Larger than 19"		
<b>Raccoon Lake (P)</b>	Carp	All Sizes			
<b>Saganashkee Slough (P)</b>	Channel Catfish	Larger than 18"			
<b>Schiller Pond (P)</b>	Carp	All Sizes			
<b>Sycamore Lake (P)</b>	Channel Catfish	Larger than 23"			
	Carp	All Sizes			
<b>Wolf Lake (P)</b>	Carp		All Sizes		
<b>RIVERS &amp; CREEKS</b>					
<b>Big Muddy River (P) Rend Lake to Rt. 149</b>	Carp	All Sizes			
<b>Calumet River, Cal Sag Channel, Little Calumet River (from Cal Sag Channel to the Calumet River) (P)</b>	Black Bass		All Sizes		
	Carp		Less than 12"		Larger than 12"
	Sunfish	All Sizes			
	Yellow Bass		Less than 8"	Larger than 8"	
<b>Casey Fork Creek (P)</b>	Carp		All Sizes		
	Channel Catfish		All Sizes		
<b>Cedar Creek (Warren Co.) (P)</b>	Carp			All Sizes	
<b>Chicago River, North and South Branches, North Shore Channel, Chicago Sanitary and Ship Channel (P)</b>	Carp			Less than 12"	Larger than 12"
	Largemouth Bass		All Sizes		
	Sunfish	All Sizes			
<b>Des Plaines River (P) Rt. 120 to Hoffman Dam</b>	Carp		Larger than 19"		
<b>Hoffman Dam to Lockport</b>	Channel Catfish	All Sizes			
	Carp		Less than 22"	Larger than 22"	
<b>Lockport to Kankakee River</b>	Channel Catfish		All Sizes		
	Freshwater Drum		All Sizes		
	Channel Catfish		All Sizes		
	Carp			Less than 18"	Larger than 18"
<b>DuPage River (P) Headwaters to Rt. 6</b>	Carp	All Sizes			
<b>Rt. 6 to Des Plaines River</b>	Carp		All Sizes		
	Channel Catfish		All Sizes		
	Smallmouth Bass		All Sizes		
<b>East Branch of the DuPage River (P)</b>	Carp	All Sizes			
<b>Fox River (P)</b>	Channel Catfish	All Sizes			
	Carp		All Sizes		



Water	Fish Species	1 meal/week	1 meal/month	6 meals/year	Do Not Eat
<b>RIVERS &amp; CREEKS</b>					
<b>Galena River (P)</b>	Carp	Less than 20"	Larger than 20"		
<b>Illinois River (P)</b>					
Headwaters to Marseilles Dam	White Bass		All Sizes		
	Channel Catfish				All Sizes
	Carp			All Sizes	
	Smallmouth Bass		All Sizes		
Starved Rock Pool	White Bass		All Sizes		
	Channel Catfish		All Sizes		
	Carp		All Sizes		
Peoria Pool	Largemouth Bass	All Sizes			
	Channel Catfish	Less than 12"	12" to 16"	16" to 18"	Larger than 18"
	Carp		All Sizes		
Peoria Dam to Mississippi River	Carp (includes Bighead & Silver)	All Sizes			
	Channel Catfish	Larger than 16"			
<b>Kankakee River (P)</b>					
Kankakee Dam to Wilmington Dam	Carp	All sizes			
Wilmington Dam to Illinois River	Carp		All sizes		
<b>Kaskaskia River (P)</b> (above Lake Shelbyville)	Carp	Larger than 18"			
<b>Kickapoo Creek (P)</b> (IL River near Peoria)	Carp	Larger than 17"			
	Channel Catfish	Less than 17"	Larger than 17"		
<b>Kishwaukee River (P)</b>	Carp	Less than 26"	Larger than 26"		
	Channel Catfish	Larger than 18"			
<b>Kishwaukee River South Branch (P)</b>	Carp		All sizes		
<b>Lake Fork Creek (Piatt and Douglas Counties) (P)</b>	Carp	All Sizes			
<b>Mackinaw River (P)</b>	Carp	Larger than 17"			
<b>Mazon River (P)</b>	Carp	All sizes			
<b>Nippersink Creek (McHenry County) (P)</b>	Channel Catfish	All sizes			
<b>Pecatonica River (P)</b>	Carp	Larger than 21"			
<b>Rock River (P)</b>					
State Line to Fordam Dam	Carp	Less than 23"	Larger than 23"		
	Channel Catfish	Larger than 16"			
Rockford Dam to Milan Steel Dam	Carp		All Sizes		
	Channel Catfish	Larger than 16"			
	Flathead Catfish	Larger than 20"			
Milan Steel Dam to Mississippi River	Carp		All Sizes		
	Channel Catfish	All Sizes			
	White Bass	All Sizes			
<b>Salt Creek (Des Plaines River Basin) (P)</b>	Carp		Less than 24"		Larger than 24"
<b>Sangamon River (P)</b>					
Lake Decatur to Roby	Carp		All Sizes		
Lake Decatur to IL River	Channel Catfish	Less than 21"	Larger than 21"		
<b>Sangamon River South Fork (C)</b>	Carp	Larger than 18"			
<b>Skillet Fork Creek (P)</b>	Carp	Larger than 21"			
<b>Spring Creek (Sangamon County) (P)</b>	Carp	All Sizes			
<b>Sugar River (Rock River Basin) (P)</b>	Carp	Larger than 18"			

(C) = Listed due to chlordane contamination

(P) = Listed due to polychlorinated biphenyl (PCB) contamination

\* = Denotes change for the 2008 season.

## **ATTACHMENT 5**

**GROUNDWATER MIGRATION CONTROL SYSTEM**  
**System Down Time 2003 - 2007**

From	To	Duration	Remarks
11/18/2003	11/19/2003	24 hrs.	Requested by POTW
5/8/2004	5/8/2004	8 hrs.	Damage to discharge pipeline being repaired
7/30/2004	7/30/2004	4 hrs.	Requested by POTW
9/24/2004	9/24/2004	6 hrs.	Replacement of pump on EW-1.
10/1/2004	10/1/2004	8 hrs.	Replacement of pump on EW-3.
10/3/2004	10/3/2004	4 hrs.	Power supply failure
10/4/2004	10/4/2004	8 hrs.	Replacement of pump on EW-2
3/14/2005	4/10/2005	27 days	Wells being tested for sand content at request of EPA
4/11/2005	4/11/2005	1 day	Pumps in all wells changed
10/13/2005	10/17/2005	4 days	Requested by POTW
10/29/2005	10/29/2005	8 hrs.	Leak in the EW-1 pitless adapter. Well taken out of service.
11/1/2005	11/4/2005	3 days	Pumps in all wells changed.
4/2/2006	4/3/2006	1 day	Requested by POTW
6/17/2006	6/17/2006	8 hrs.	Power supply failure
7/19/2006	7/19/2006	12 hrs	Power supply failure
8/14/2006	8/14/2006	10 hrs.	Planned system maintenance.
8/15/2006	8/15/2006	10 hrs.	Planned system maintenance.
8/17/2006	8/17/2006	10 hrs.	Planned system maintenance.
8/18/2006	8/18/2006	10 hrs.	Planned system maintenance.
8/29/2006	8/29/2006	3 hrs.	Pump replacement.
8/30/2006	8/30/2006	3 hrs.	Pump replacement.
11/30/2006	12/4/2006	4 days	Power supply failure
12/5/2007	12/7/2007	2 days	Requested by POTW



## **ATTACHMENT 6**

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

### Five-Year Review Site Inspection Checklist (Template)

I. SITE INFORMATION			
Site name: <b>Sauget Area 2 – Site R</b>	Date of inspection: <b>November 7, 2007</b>		
Location and Region: <b>Sauget, IL/R5</b>	EPA ID: <b>05XX</b>		
Agency, office, or company leading the five-year review: <b>USEPA – Region 5</b>	Weather/temperature:		
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Landfill cover/containment  <input type="checkbox"/> Access controls  <input type="checkbox"/> Institutional controls  <input checked="" type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment  <input type="checkbox"/> Other _____             </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation  <input checked="" type="checkbox"/> Groundwater containment  <input checked="" type="checkbox"/> Vertical barrier walls             </td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input checked="" type="checkbox"/> Groundwater containment <input checked="" type="checkbox"/> Vertical barrier walls
<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input checked="" type="checkbox"/> Groundwater containment <input checked="" type="checkbox"/> Vertical barrier walls		
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached			
II. INTERVIEWS (Check all that apply)			
<b>1. O&amp;M site manager</b> <u>Steve Smith</u> <u>Director, Remedial Projects</u> <u>11/7/2007</u> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input checked="" type="checkbox"/> by phone   Phone no. <u>(314)674-4660</u> Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			
<b>2. O&amp;M staff</b> <u>Richard Williams</u> <u>Consultant</u> <u>11/7/2007</u> <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. <u>(630) 698-0275</u> Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			
<b>3. Local regulatory authorities and response agencies</b> (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.  Agency <u>IEPA</u> Contact <u>Sandy Bron</u> <u>Project Mgr.</u> _____ <div style="display: flex; justify-content: space-between; font-size: small;"> <span>Name</span> <span>Title</span> <span>Date</span> <span>Phone no.</span> </div> Problems; suggestions; <input type="checkbox"/> Report attached _____ _____			



4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input checked="" type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits _____ Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input checked="" type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks: <u>The site is fenced and locked, and not normally manned.</u>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<b>IV. O&amp;M COSTS</b>				
1.	<b>O&amp;M Organization</b> <input type="checkbox"/> State in-house <input type="checkbox"/> Contractor for State <input type="checkbox"/> PRP in-house <input checked="" type="checkbox"/> Contractor for PRP <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Contractor for Federal Facility <input type="checkbox"/> Other _____			
2.	<b>O&amp;M Cost Records</b> <input type="checkbox"/> Readily available <input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ <input type="checkbox"/> Breakdown attached  <div style="text-align: center;">Total annual cost by year for review period if available</div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <span>From <u>7/15/03</u> Date</span> <span>To <u>12/31/03</u> Date</span> <span><u>\$827,000</u> Total cost</span> <span><input type="checkbox"/> Breakdown attached</span> </div>			

From <u>1/1/04</u>	To <u>12/31/04</u>	<u>\$3,226,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From <u>1/1/05</u>	To <u>12/31/05</u>	<u>\$3,900,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From <u>1/1/06</u>	To <u>12/31/06</u>	<u>\$2,216,000</u>	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**  
Describe costs and reasons: POTW used large quantities of granular activated carbon during the first year or two of operation to prevent inhibition of the activated sludge beds. The cost of the carbon was \$224,000, \$151,000, \$620,000, and \$355,000 in each of 2003, 2004, 2005, and 2006.

---

**V. ACCESS AND INSTITUTIONAL CONTROLS**    ☒ Applicable    ☐ N/A

**A. Fencing**

1.    ☐ Fencing damaged    ☒ Location shown on site map    ☒ Gates secured    ☐ N/A  
Remarks \_\_\_\_\_

---

**B. Other Access Restrictions**

1.    ☒ Signs and other security measures    ☐ Location shown on site map    ☐ N/A  
Remarks \_\_\_\_\_

---

**C. Institutional Controls (ICs)**

1.    **Implementation and enforcement**

Site conditions imply ICs not properly implemented    ☐ Yes    ☐ No    ☒ N/A  
Site conditions imply ICs not being fully enforced    ☐ Yes    ☐ No    ☒ N/A

Type of monitoring (e.g., self-reporting, drive by) In accordance with Draft O&M Plan  
Frequency In accordance with draft O&M Plan.  
Responsible party/agency Responsible Parties.  
Contact Steve Smith    Director, Remedial Projects    11/7/07    (314)674-4660  

Name
Title
Date
Phone no.

Reporting is up-to-date    ☒ Yes    ☐ No    ☐ N/A  
Reports are verified by the lead agency    ☐ Yes    ☐ No    ☐ N/A

Specific requirements in deed or decision documents have been met    ☒ Yes    ☐ No    ☐ N/A  
Violations have been reported    ☐ Yes    ☐ No    ☒ N/A  
Other problems or suggestions:    ☐ Report attached

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

2.    **Adequacy**    ☒ ICs are adequate    ☒ ICs are inadequate    ☐ N/A  
Remarks Lack of ordinance prohibiting groundwater use for portion of site in Village of Oakdale.

<b>D. General</b>			
1.	<b>Vandalism/trespassing</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No vandalism evident Remarks _____		
2.	<b>Land use changes on site</b> <input checked="" type="checkbox"/> N/A Remarks _____		
3.	<b>Land use changes off site</b> <input checked="" type="checkbox"/> N/A Remarks _____		
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
1.	<b>Roads damaged</b> <input checked="" type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A Remarks _____		
<b>B. Other Site Conditions</b>			
Remarks			
<b>VII. LANDFILL COVERS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement</b> (Low spots) <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident Areal extent _____    Depth _____ Remarks _____		
2.	<b>Cracks</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident Lengths _____    Widths _____    Depths _____ Remarks _____		
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident Areal extent _____    Depth _____ Remarks _____		
4.	<b>Holes</b> <input type="checkbox"/> Location shown on site map <input type="checkbox"/> Holes not evident Areal extent <u>3 - 4 feet diameter</u> Depth <u>18 inches</u> Remarks <u>Holes filled with compacted clay on 11/5/07 and seeded.</u>		

5.	<b>Vegetative Cover</b> <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks <u>N/A</u> _____ _____	<input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input checked="" type="checkbox"/> No signs of stress	
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> <input type="checkbox"/> N/A Remarks <u>Spoil from slurry wall construction stockpiled on landfill and covered with HDPE liner and rip rap on slopes</u> _____ _____		
7.	<b>Bulges</b> Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map Height _____	<input checked="" type="checkbox"/> Bulges not evident
8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____ <input type="checkbox"/> Location shown on site map      Areal extent _____	
9.	<b>Slope Instability</b> Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of slope instability
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
2.	<b>Bench Breached</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
3.	<b>Bench Overtopped</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A or okay
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> Areal extent _____      Depth _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of settlement

	Remarks				
2.	<b>Material Degradation</b> Material type _____ Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of degradation		
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of erosion		
4.	<b>Undercutting</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting		
5.	<b>Obstructions</b> Type _____ <input type="checkbox"/> Location shown on site map Areal extent _____ Size _____ Remarks _____	<input type="checkbox"/> No obstructions			
6.	<b>Excessive Vegetative Growth</b> Type _____ <input type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____				
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A					
1.	<b>Gas Vents</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____	<input type="checkbox"/> Active	<input type="checkbox"/> Passive		
2.	<b>Gas Monitoring Probes</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____				
3.	<b>Monitoring Wells</b> (within surface area of landfill) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____				
4.	<b>Leachate Extraction Wells</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____				



5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed	<input type="checkbox"/> N/A
	Remarks _____			
<b>E. Gas Collection and Treatment</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
1.	<b>Gas Treatment Facilities</b>	<input type="checkbox"/> Flaring	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse
		<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	Remarks _____			
2.	<b>Gas Collection Wells, Manifolds and Piping</b>	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	
	Remarks _____			
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings)	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> N/A
	Remarks _____			
<b>F. Cover Drainage Layer</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
1.	<b>Outlet Pipes Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks _____			
2.	<b>Outlet Rock Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks _____			
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				
1.	<b>Siltation</b> Areal extent _____	Depth _____	<input type="checkbox"/> N/A	
	<input type="checkbox"/> Siltation not evident			
	Remarks _____			
2.	<b>Erosion</b> Areal extent _____	Depth _____		
	<input type="checkbox"/> Erosion not evident			
	Remarks _____			
3.	<b>Outlet Works</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks _____			
4.	<b>Dam</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
	Remarks _____			
<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A				

1.	<b>Deformations</b> Horizontal displacement _____ Vertical displacement _____ Rotational displacement _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident
2.	<b>Degradation</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident
<b>I. Perimeter Ditches/Off-Site Discharge</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Siltation not evident
2.	<b>Vegetative Growth</b> <input checked="" type="checkbox"/> Vegetation does not impede flow Areal extent _____ Type _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A
3.	<b>Erosion</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident
4.	<b>Discharge Structure</b> Remarks _____	<input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A
<b>VIII. VERTICAL BARRIER WALLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Settlement</b> Areal extent _____ Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Settlement not evident
2.	<b>Performance Monitoring</b> Type of monitoring: <u>Groundwater, surface water, and river sediment sampling</u> <input type="checkbox"/> Performance not monitored Frequency <u>In accordance with draft O&amp;M Plan</u> <input type="checkbox"/> Evidence of breaching Head differential <u>Varies with riverstage</u> Remarks _____	
<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____	

2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>C. Treatment System</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Treatment Train</b> (Check components that apply) <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Metals removal  <input type="checkbox"/> Air stripping  <input type="checkbox"/> Filters  <input type="checkbox"/> Additive (e.g., chelation agent, flocculent)  <input type="checkbox"/> Others _____         </div> <div> <input type="checkbox"/> Oil/water separation  <input type="checkbox"/> Carbon adsorbers         </div> <div> <input type="checkbox"/> Bioremediation         </div> </div> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks: <u>Discharge to POTW</u> _____
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____
4.	<b>Discharge Structure and Appurtenances</b>

	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance	Remarks _____ _____
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____	
6.	<b>Monitoring Wells (pump and treatment remedy)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____	
<b>D. Monitoring Data</b>		
1.	<b>Monitoring Data</b> <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality	
2.	Monitoring data suggests: <i>Monitoring data will be evaluated as part of RI/FS and final site-wide ROD.</i> <input checked="" type="checkbox"/> Groundwater plume is effectively contained <input checked="" type="checkbox"/> Contaminant concentrations are declining	
<b>D. Monitored Natural Attenuation</b>		
1.	<b>Monitoring Wells (natural attenuation remedy)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____	
<b>X. OTHER REMEDIES</b>		
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. NONE		
<b>XI. OVERALL OBSERVATIONS</b>		
<b>A. Implementation of the Remedy</b>		
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).  _____ The objective of the barrier wall is to pump out the water naturally going into the barrier wall, for off-site treatment at the local POTW. This is being met. Surface water sampling in the Mississippi River has demonstrated that the barrier wall is effectively capturing the groundwater plume. <i>EPA will evaluate whether the remedy is effective and functioning as designed after several site documents are finalized and relevant issues are resolved.</i>		

**B. Adequacy of O&M**

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

See Attached – O&M Table 1-6 update

The GMCS has an excellent on-line history

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

- Eliminate water measurements in all piezometers except PZ5 through PZ 8. Only PZ5 and PZ8 are used to control the system, with PZ 6 and PZ 7 used periodically as backups. Automatic water measurements in other piezometers are unnecessary and not used. The daily groundwater surfer plots should be eliminated since they are not used for anything.

- Instead of quarterly groundwater sampling, the system should go to a semi-annual groundwater sampling (at the same time the semi-annual Mississippi River sampling is done).

The above suggestions for optimization will be evaluated by EPA.

## **ATTACHMENT 7**

*Belleville News-Democrat, 10/20/07*



**EPA to Review  
Sauget Area 2 Site R  
Sauget, Illinois**

U.S. Environmental Protection Agency Region 5 will begin a five-year review of the interim cleanup at Site R, located within the Sauget Area 2 Superfund site in Sauget, Ill. Sauget Area 2 is made up of five inactive disposal sites called Sites O, P, Q, R, and S. Site R is a 36-acre closed industrial waste disposal area bordering the eastern edge of the Mississippi River. Hazardous and nonhazardous waste from nearby former Monsanto plants were disposed of at Site R from 1957 to 1977. Superfund law requires regular reviews (at least every five years) where cleanup is under way but hazardous waste remains managed on-site. This is the first such review since construction work began in August 2003.

EPA's 2002 cleanup plan included:

- Constructing a barrier wall to capture contaminated ground water and prevent it from reaching the Mississippi River
- Treating ground water off-site to meet discharge requirements before discharging to the river
- Monitoring ground water quality and ground water levels
- Monitoring sediment and surface water in the river for contamination

EPA will inspect the site, review monitoring results to ensure the cleanup continues to protect people's health and the environment and prepare a report. The report will be made available for public review by August 2008 at the EPA Web site:

[www.epa.gov/region5/superfund/fiveyear/fyr\\_index.html#five\\_illinois](http://www.epa.gov/region5/superfund/fiveyear/fyr_index.html#five_illinois)  
and at:

Cahokia Public Library  
140 Cahokia Park Drive

More information can be obtained by contacting:

**Patricia Krause**  
EPA Community  
Involvement Coordinator  
312-886-6195  
[krause.patricia@epa.gov](mailto:krause.patricia@epa.gov)

**Ross del Rosario**  
EPA Remedial Project Manager  
312-886-9506  
[delrosario.rosauro@epa.gov](mailto:delrosario.rosauro@epa.gov)

800-621-8431, 9 a.m. - 4:30 p.m., weekdays

## **ATTACHMENT 8**



**DOCUMENTS REVIEWED**  
**(page 1 of 3)**

Evaluation of Subsurface Engineered Barriers at Waste Sites, U.S. EPA, EPA 542-R-98-005, August 1998

Administrative Order by Consent for RI/FS, Docket No. V-W-01-C-622, November 24, 2000.

Focused Feasibility Study, Sauget Area 2, Solutia, Inc., March 31, 2002.

Record of Decision for the Groundwater Operable Unit (OU2), Sauget Area 2, U.S. EPA, September 30, 2002.

Public Health Assessment for Sauget Area 2 Landfill: Sites P, Q and R, Illinois Department of Public Health, February 5, 2003.

Letter from Jerry Richardson, American Bottoms Regional Wastewater Treatment Facility, to Richard Williams, Solutia, Inc., regarding Draft Permit No. 06-138, May 9, 2003.

Explanation of Significant Differences, Sauget Area 2, U.S. EPA, July 30, 2003.

Status Report, Sauget Area 2 Groundwater Migration Control System, URS, Inc., November 16, 2004.

Technical Memorandum, Interim Operating Period II, Groundwater Migration Control System, Solutia, Inc., January 2, 2005.

Technical Memorandum, Comments Regarding Spoils Management at Site R, CH2M Hill, March 24, 2005.

Technical Memorandum, Interim Operating Period I, Groundwater Migration Control System, Solutia, Inc., April 1, 2005.

Letter from Steven Smith, Solutia, Inc., to Nabil Fayoumi, U.S. EPA, regarding Groundwater Migration Control Systems Operations, April 1, 2005.

Technical Memorandum, Interim Operating Period I, Groundwater Migration Control System, Solutia, Inc., May 13, 2005.

Technical Memorandum, Historical Summaries for Sauget Area 2 Sites, USEPA Augmentation to Supplemental Investigation Technical Memorandum, CH2M Hill, August 31, 2005.

**DOCUMENTS REVIEWED**  
**(page 2 of 3)**

Technical Memorandum, Review of Interim Operating Period II Data through September 27, 2005, Sauget Area 2, CH2M Hill, October 5, 2005.

Pretreatment Compliance Audit Summary Report for American Bottoms Regional Wastewater Treatment Facility, U.S. EPA, inspection dates: December 6-8, 2005.

Draft Barrier Wall Completion Report, Groundwater Migration Control System, URS Corporation, February 16, 2006.

Response to August 22, 2005 USEPA Comments on Groundwater Migration Control System Operation and Maintenance Plan for Site R, Solutia, Inc., April 10, 2006.

Draft Groundwater Migration Control System Operation and Maintenance Plan, URS Corporation, April 10, 2006.

Technical Memorandum, Review of the Draft Barrier Wall Completion Report for the Groundwater Migration Control System, CH2M Hill, June 13, 2006.

Draft Technical Memorandum, Interim Operating Period III, Groundwater Migration Control System, Solutia, Inc., July 24, 2006.

Letter from Jerry Richardson, American Bottoms Regional Wastewater Treatment Facility, to Richard Williams, Solutia, Inc., regarding Discharge Permit No. 06-138, August 15, 2006.

Technical Memorandum, Review Comments on f Interim Operating Period III Report – GMCS (July 24, 2006), CH2M Hill, August 24, 2006.

Letter from George Schillinger, Director, American Bottoms Regional Wastewater Treatment Facility, to Cheryl Newton, U.S. EPA, regarding Response to Pretreatment Compliance Audit, March 16, 2007.

Response to U.S. EPA Comments on Regional Groundwater Fate and Transport Model, GSI Environmental Inc., November 20, 2007.

Draft Notes on Site Documents, Subterranean Research, Inc., December 5, 2007.

Technical Memorandum, Comments on Interim Operating Period (IOP-III) Document, S.S. Papadopoulos and Associates, December 12, 2007.

Technical Memorandum, Feedback on Internal Draft Document from CH2M Hill dated January 15, 2008, Subterranean Research, Inc., January 21, 2008.

**DOCUMENTS REVIEWED**  
**(page 3 of 3)**

Technical Memorandum, Comprehensive Comments on Sauget Area 2 Interim Groundwater Remedy Submittals, Data, and Path Forward, CH2M Hill, January 24, 2008.

Responses to U.S. EPA letter of November 21, 2007, Solutia, Inc., February 4, 2008.  
Draft Technical Memorandum, Mass Flux Evaluation Work Plan, GSI Environmental, Inc., March 13, 2008.

Draft Technical Memorandum, Sauget Area 2, Review of GSI Preliminary Draft Document Dated 13 March 2008, Subterranean Research, Inc., April 9, 2008.

Technical Memorandum, Summary of GMCS Semi-Annual Sediment and Surface Water Sampling Events at Site R, Sauget Area 2, (Performance Verification Monitoring), and Other River Data at Sauget Area 2, CH2M Hill, April 18, 2008.

Technical Memorandum, Summary of Quarterly Groundwater Monitoring Sampling Events at Site R, Sauget Area 2, - Performance Verification Monitoring, CH2M Hill, April 18, 2008.

Technical Memorandum, Review of the Mass Flux Evaluation Work Plan, Sauget Area 2 Groundwater Migration Control System, CH2M Hill, April 25, 2008.

Weekly Summary Reports, Interim Remedial Action, CH2M Hill, various dates (2003-2007)

Response to August 22, 2005 USEPA Comments, Draft Groundwater Migration Control System Operation and Maintenance Plan, URS Corporation, undated.

Summary of Sauget Area 2 Groundwater Migration Control System Meeting, January 12, 2006, CH2M Hill, undated.

Sauget Area 2 NPL Fact Sheet, U.S. EPA, [www.epa.gov/R5Super/npl/ILD000605790](http://www.epa.gov/R5Super/npl/ILD000605790).

## **ATTACHMENT 9**

**APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS  
(ARARs)**

**Action-specific ARARs**

<b>Regulation</b>	<b>Description</b>	<b>Applicability</b>
40 CFR 125	Establishes technology-based limits for direct discharge of treatment system effluent	Applicable
40 CFR 402	Controls the direct discharge of pollutants to surface waters through the National Pollutant Discharge Elimination System (NPDES) program	Applicable
40 CFR 403.5	Specifically prohibits the direct discharge of pollutants to a publicly-owned treatment works (POTW) without treatment, that interfere with operations, or that contaminate sludge	Applicable
29 CFR 1910.120	Standards for conducting work at hazardous waste sites	Applicable
29 CFR 1926	OSHA safety and health standards	Applicable
35 IAC 306.302	Standards for expansion of existing or establishment of new combined sewer service areas	Relevant and appropriate
35 IAC 307.1101	Sewer discharge criteria that prohibit entry of certain types of pollutants into a POTW	Applicable
35 IAC 309.102	An NPDES is required for any discharge to the waters of the State of Illinois	Applicable
35 IAC 309.202	A State construction permit is required for new sewer and wastewater sources	Applicable

## **ATTACHMENT 10**

AMERICAN BOTTOMS  
REGIONAL WASTEWATER TREATMENT FACILITY

1 AMERICAN BOTTOMS ROAD

SAUGET, ILLINOIS 62201-1075

(618) 337-1710

FAX (618) 337-8919

August 15, 2006

Hand Delivered

Mr. Richard S. Williams  
Project Manager, Sauget Sites Project  
Solutia Inc.  
500 Monsanto Avenue  
Sauget, IL 62206-1198

Re: Discharge Permit No: 06-138  
For premise at: #5 Riverview Avenue  
Sauget, Illinois 62201

Dear Mr. Williams:

Herewith is the 2006-2009 Wastewater Discharge Permit and Fact Sheet. The enclosed issued permit No. 06-138 covers the wastewater discharge from the facility located in Sauget, Illinois. All discharges from this facility and related actions and reports shall be in accordance with the terms and conditions of this permit and the Ordinance.

If you wish to appeal any effluent limitations, pretreatment requirements, or conditions imposed in this wastewater discharge permit, a written notice of appeal should be filed within 30 days after the effective date of the permit. Your written notice of appeal, if filed, should be mailed or delivered to:

Village Clerk  
Village of Sauget  
2897 Falling Springs Road  
Sauget, Illinois 62206

If you have any questions related to this permit, please call me at 337-1710.

Sincerely,



Jerry G. Richardson II  
Pretreatment Coordinator

Enclosure

CITY OF EAST ST. LOUIS

- VILLAGE OF SAUGET

- VILLAGE OF CAHOKIA

COMMONFIELDS OF CAHOKIA PUBLIC WATER DISTRICT

VILLAGE OF SAUGET



AMERICAN BOTTOMS REGIONAL  
WASTEWATER TREATMENT FACILITY

WASTEWATER DISCHARGE PERMIT

for

SOLUTIA, INC. - Site R

UAO Remediation Wastewater  
# V-W-02-C-716

PERMIT NO. 06-138



**VILLAGE OF SAUGET  
AMERICAN BOTTOMS REGIONAL WASTEWATER TREATMENT FACILITY**

<u>TABLE OF CONTENTS</u>	
Wastewater Discharge Permit No. 06-138.....	1
<u>PART 1 - GENERAL CONDITIONS OF PERMIT</u> .....	2
A. <u>General</u> .....	2
B. <u>Definition of UAO Remediation Wastewater</u> .....	2
C. <u>Prohibitive Standards</u> .....	2
D. <u>Prohibition of Improper Dilution</u> .....	2
E. <u>Duration</u> .....	2
F. <u>Non-transferability of Discharge Permit</u> .....	2
G. <u>Change in Conditions</u> .....	3
H. <u>Access</u> .....	3
I. <u>Retention of Records</u> .....	3
J. <u>Analytical Methods</u> .....	4
K. <u>Pretreatment Facilities</u> .....	4
L. <u>Permit Modifications</u> .....	4
M. <u>Civil and Criminal Penalties</u> .....	5
N. <u>Additional Information</u> .....	5
O. <u>Resampling</u> .....	5
P. <u>Notifications</u> .....	6
Q. <u>Report Submittal</u> .....	6
R. <u>Revocation of Permit</u> .....	6
S. <u>Other Ordinances</u> .....	7
<u>PART 2 - GENERAL AND SPECIFIC REPORTING REQUIREMENTS</u> .....	7
A. <u>General</u> .....	7
B. <u>Specific</u> .....	7
1. <u>Monitoring Reports</u> .....	7
2. <u>Compliance Deadline Report</u> .....	7
<u>PART 3 - GENERAL SAMPLING AND TESTING REQUIREMENTS</u> .....	8
<u>PART 4 - EFFLUENT LIMITATIONS, SAMPLING AND TESTING REQUIREMENTS</u>	9
A. <u>Local Limits</u> .....	9
B. <u>State Limits</u> .....	10
C. <u>National Categorical Pretreatment Standards</u> .....	10
D. <u>Monitoring Schedule</u> .....	11
<u>PART 5 - COMPLIANCE SCHEDULE</u> .....	13
<u>PART 6 - SPECIAL CONDITIONS</u> .....	13
<u>FIGURE 1 - MONITORING LOCATION</u> .....	16

AMERICAN BOTTOMS  
REGIONAL WASTEWATER TREATMENT FACILITY

1 AMERICAN BOTTOMS ROAD

SAUGET, ILLINOIS 62201-1075

(618) 337-1710

FAX (618) 337-8919

August 15, 2006

Solutia, Inc. - W.G. Krummrich Plant  
Site R - UAO # V-W-02-C-716

500 Monsanto Avenue  
Sauget, Illinois 62206-1198

UAO Remediation Wastewater Discharge Permit No. 06-138

Dear Sirs:

In accordance with all the terms and conditions of Ordinance 632, as amended, of the Village of Sauget; the 1977 Regional Agreement as amended; Section 46 of the Illinois Environmental Protection Act of 1970 (Ill. Rev. Stat. 1987, Ch. 1111/2, Sec. 1046) as amended; and Ill. Rev. Stat. 1987, Ch 24, Sec. 11-141-7; permission is hereby granted to Solutia Inc., as owner and operator, to discharge UAO Remediation Wastewater into sewer lines tributary to the American Bottoms Regional Wastewater Treatment Plant in accordance with and subject to the provisions of attached American Bottoms Regional Wastewater Discharge Permit No. 06-138 ("Permit").

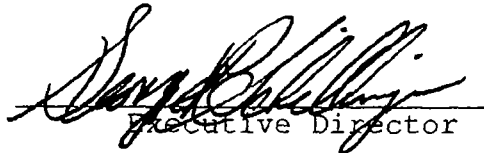
This Permit is granted in response to the application filed on January 24, 2006 in the office of the General Manager, #1 American Bottoms Road, Sauget, Illinois 62201, and in conformity with plans, specifications and other data submitted in support of the above application, all of which are filed with and considered as a part of this Permit, together with the attached conditions and requirements.

Nothing herein shall be construed as a permit or as permission for the permittee to violate the provisions of any sewer use ordinance in effect within the jurisdiction of any unit of local government in which the permittee's facility is located.

This Permit will take effect on August 15, 2006, and will expire on August 1, 2009.

VILLAGE OF SAUGET

By:

  
Executive Director

CITY OF EAST ST. LOUIS

-

VILLAGE OF SAUGET

-

VILLAGE OF CAHOKIA

COMMONFIELDS OF CAHOKIA PUBLIC WATER DISTRICT

PART 1 - GENERAL CONDITIONS OF PERMIT

- A. General - This Wastewater Discharge Permit shall be expressly subject to all provisions of Ordinance 632 of the Village of Sauget, including any further amendments thereto (hereinafter "the Ordinance") and all other applicable regulations, user charges, and fees established by the Village of Sauget. In consideration of the granting of this Permit, the permittee shall comply with all provisions of the Ordinance, Permit conditions, and the Implementation procedures including, but not limited to the specific requirements of these General Condition Articles. Any Permit noncompliance constitutes a violation of the Ordinance, and is grounds for enforcement action.
- B. Definition of UAO Remediation Wastewater: "UAO Remediation Wastewater" means any wastewater, including leachate and groundwater, discharged to the POTW pursuant to the Administrative Order for Remedial Design and Interim Remedial Action ("UAO") (Docket No. V-W-02-C-716) and accompanying Record of Decision issued by the United States Environmental Protection Agency, Region 5, on September 30, 2002, under the authority of Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act, commonly known as Superfund ("CERCLA"), (42 U.S.C. § 9606(a)).
- C. Prohibitive Standards - The permittee shall comply with all prohibitive discharge standards pursuant to Section 3.2 of the Ordinance and all Local, State, and Federal discharge limits set forth in the Permit.
- D. Prohibition of Improper Dilution - Improper dilution shall be prohibited pursuant to Section 3.6 of the Ordinance.
- E. Duration - This Permit is issued effective August 15, 2006, and shall expire on August 1, 2009.
- F. Non-transferability of Discharge Permit: A Discharge Permit issued for the discharge of the UAO Remediation Wastewater shall only be transferable to another person upon the prior written approval of such transfer by the POTW. Any change in the person to whom such Discharge Permit has been issued without the prior written approval of the POTW shall render the Discharge Permit null and void.

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

- G. Change in Conditions - Pursuant to Section 4.7 of the Ordinance, in the event the type, quality, character or volume of Pollutants in a Discharge, including the listed or characteristic hazardous wastes for which the permittee has submitted initial notification under Section 4.13.5 of the Ordinance, is expected to substantially change as reasonably determined by the permittee or POTW, the permittee or his assignee (see paragraph E. above) shall give sixty (60) days advance notice in writing to the POTW and shall make a new application to the POTW and the Sewer System Owner prior to said change. No permittee shall substantially change the type, quality, character or volume of its Wastewater beyond that allowed by this Permit without prior approval of the Sewer System Owner and the POTW.
- H. Access - Pursuant to Section 4.15 of the Ordinance, persons or occupants of premises in which a Discharge source or treatment system is located or in which records are kept shall allow the POTW or its representative ready access upon presentation of credentials at reasonable times to all parts of said premises for the purposes of inspection, sampling, examination and photocopying of records required to be kept by the Ordinance and this Permit, and in the performance of any of their duties. The POTW shall have the right to set up on the permittee's property such devices as are necessary to conduct sampling, monitoring and metering operations.
- I. Retention of Records - Pursuant to Section 4.15 of the Ordinance, the permittee shall maintain records of all information resulting from any monitoring activities required by this Ordinance and shall include:
  1. The date, exact place, method and time of sampling and the names of the Person or Persons taking the samples;
  2. The dates analyses were performed;
  3. Who performed the analyses;
  4. The analytical techniques/methods used; and
  5. The results of such analyses.

The permittee shall maintain for inspection by the POTW, IEPA or USEPA such records for a minimum of three (3) years. This period of retention shall be extended during the course

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

of any unresolved litigation regarding the Discharge of Pollutants by the permittee or operation of the POTW Pretreatment program or when requested by the Regional Administrator of USEPA or the Director of IEPA.

- J. Analytical Methods - All measurements, sampling, tests, and analyses to which reference is made in this Permit shall be determined and performed in accordance with the procedures established by the Administrator of the United States Environmental Protection Agency (hereafter "Administrator") pursuant to Section 304(g) of the Act and contained in 40 CFR Part 136 and amendments thereto or with any other test procedures approved by the Administrator. Sampling shall be performed in accordance with the techniques approved by the Administrator. Where 40 CFR Part 136 does not include sampling or analytical techniques for the Pollutants in question, or where the Administrator determines that the Part 136 sampling and analytical techniques are inappropriate for the Pollutant in question, sampling and analyses shall be performed using validated analytical methods or any other sampling and analytical procedures, including procedures suggested by the POTW or other parties, approved by the Administrator.
- K. Pretreatment Facilities - The permittee shall provide necessary Wastewater Pretreatment as required to comply with the Ordinance and shall achieve compliance with all applicable Pretreatment Requirements and Standards within the time limitations as specified by appropriate statutes, regulations, and the Ordinance. Any facilities required to pretreat Wastewater to a level acceptable to the POTW shall be provided, properly operated and maintained at the permittee's expense. Such Pretreatment facilities shall be under the control and direction of an IEPA certified Wastewater Treatment Operator.
- L. Permit Modifications - The terms and conditions of this Permit may be modified by the POTW during the term of the Permit for good cause including, but not limited to, the following: to incorporate any new or revised Federal, State, or local Pretreatment Standards or Requirements; to address significant alterations or additions to the permittee's operation, processes, or Wastewater volume or character since the time of Wastewater Discharge Permit issuance; a change in the POTW that requires either a temporary or permanent reduction or elimination of the authorized Dis-

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

charge; misrepresentation or failure to fully disclose all relevant facts in the Wastewater Discharge Permit application or in any required reporting; revision of or a grant of variance from Categorical Pretreatment Standards pursuant to 40 CFR 403.13; to correct typographical errors in the Wastewater Discharge Permit; or to reflect a transfer of the facility ownership and/or operation to a new owner/operator (as provided in paragraph F. above). The permittee shall be informed of any proposed changes in its Permit at least 30 days prior to the effective date of any modification, and shall have all rights of appeal as provided in Section 4.12 of the Ordinance.

- M. Civil and Criminal Penalties - Pursuant to Part 6 of the Ordinance, any permittee who is found to have violated an Order of the POTW or who has failed to comply with any provision of the Ordinance, and the orders, rules, and regulations and Wastewater Discharge Permits issued thereunder, may be fined by appropriate suit at law in an amount not less than one hundred dollars (\$100) nor more than one thousand dollars (\$1000) per day for each violation. In addition to the penalties provided herein, the POTW may recover reasonable attorney's fees, court costs, court reporter fees and other expenses of litigation by appropriate suit at law against the Person found to have violated this Ordinance or the orders, rules, regulations and Permits issued thereunder.

Any Person who knowingly makes any false statements, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to the Ordinance or Wastewater Discharge Permit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under the Ordinance, shall in addition be guilty of a misdemeanor and upon conviction, be punished by a fine of \$500 to \$1,000, for each offense.

- N. Additional Information - The permittee shall furnish any additional information as may be reasonably requested by the Village of Sauget from time to time.
- O. Resampling - Pursuant to Section 4.13.3.7 of the Ordinance, if sampling performed by the permittee indicates a violation, the permittee shall notify the POTW within 24 hours of

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

becoming aware of the violation. The permittee shall also repeat the sampling and analysis and submit the results of the repeat analysis to the POTW within 30 days after becoming aware of the violation, except the permittee is not required to resample if:

1. The POTW performs sampling at the permittee's location at a frequency of at least once per month, or
2. The POTW performs sampling at the permittee's location between the time when the permittee performs its initial sampling and the time when the permittee receives the results of this sampling.
3. The POTW may waive the resampling requirements if the SIU performs compliance self-monitoring at a frequency of at least once per month.

Resampling is only required for those parameters for which the violation has been identified.

P. Notifications - The following verbal and written notifications are required:

1. Pursuant to Section 4.13.3.7 of the Ordinance, if sampling performed by the permittee indicates a violation of any requirements of the Ordinance or this Permit, the permittee shall notify the POTW within 24 hours of becoming aware of the violation. Such notification may be made orally by telephone. Voice mail may not be used to comply with the notification requirement.

Q. Report Submittal - All reports and/or notifications required by this Permit shall be submitted to:

Pretreatment Coordinator  
American Bottoms Regional Wastewater  
Treatment Facility  
#1 American Bottoms Road  
Sauget, Illinois 62201  
Telephone: (618) 337-1710  
Facsimile: (618) 337-8919

R. Revocation of Permit Pursuant to Section 5.3 of the Ordinance, this Permit may be revoked by the POTW for viola-

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

tions as identified in Section 5.3.1 of the Ordinance, and in accordance with the procedures set forth in Section 5.3.2 of the Ordinance.

S. Other Ordinances: The Significant Industrial User to which this permit is issued is subject to the following Ordinance(s) of the Village of Sauget:

1. Ordinance No. 536, as amended, which establishes user charges for the American Bottoms Regional Wastewater Treatment Facility.
2. Ordinance No. 380, as amended, which establishes user charges for the Village of Sauget Physical-Chemical Wastewater Treatment Plant.

PART 2 - GENERAL AND SPECIFIC REPORTING REQUIREMENTS

A. General - The General Pretreatment Regulations of 40 CFR 403.12 and the Ordinance set forth basic reporting requirements that apply to the permittee.

B. Specific - The specific reporting requirements of this Permit include the following reporting requirements:

1. Monitoring Reports - Monitoring results obtained shall be summarized and reported on a monthly basis. Except as otherwise provided in Part 6 of the Permit, the report is due on or before 45 days after the end of the month in which the sampling was performed. The report shall indicate the nature and concentration of all pollutants in the wastewater discharges which are regulated by the standards set forth in this Permit and include measured or estimated maximum and average daily flows. These reports will satisfy the requirement for the Periodic Compliance Report, provided they contain all the information and certifications required pursuant to Section 4.13.3 of the Ordinance.

2. Compliance Deadline Report - Pursuant to Section 4.13.2 of the Ordinance, within ninety (90) days following the date for final compliance with any applicable Pretreatment Standards, or in the case of a New Source, within ninety (90) days following commencement of the Discharge of Wastewater into the POTW, any permittee subject to any Pretreatment Standards shall submit a report on compliance with any applicable Pretreatment Standards in a form pre-



scribed and furnished by the POTW. This report shall contain information as described in Section 4.13.2.2 of the Ordinance.

PART 3 - GENERAL SAMPLING AND TESTING REQUIREMENTS

- A. The permittee is responsible for compliance sampling. The monitoring facilities designated by this Permit are shown on Figure 1.
- B. Compliance monitoring results and frequencies may be reviewed periodically by the Village of Sauget and appropriate adjustments made to frequencies and parameters in a modified or revised Wastewater Discharge Permit.
- C. All handling and preservation of collected samples and laboratory analyses shall be performed in accordance with procedures contained in 40 CFR Part 136 and amendments thereto unless specified otherwise in the monitoring conditions of this Permit. Composite sampling, where called for, shall be performed over a twenty-four (24) hour period by flow or time proportionate methods.

The test procedures for all samples shall conform to one of the USEPA approved test methods which provides the most sensitive detection limits for the pollutant under investigation listed in the current issue of the Code of Federal Regulations, and the most recent addendum published by the Federal Register. The testing for priority organic pollutants shall be conducted utilizing gas chromatograph/mass spectrometer (GC/MS) methods and procedures. Other test procedures may be approved by the USEPA, pursuant to Section 4.15.2 of the Ordinance.

If more than one method for analysis of a substance is approved for use, a method having a detection limit lower than the permit limit shall be used. If the detection limit of all methods is higher than the permit limit, the method having the lowest detection limit shall be used and a report of less than detection limit shall constitute compliance. However should EPA approve a method with a lower detection limit during the term of this permit, the permittee shall use the newly approved method.

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

- D. The appropriate flow measurement devices and methods consistent with approved scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.
- E. For each measurement or sample taken pursuant to the requirements of this Permit, the permittee shall maintain and submit records which include:
  - 1. The date, location, and type of sample collected;
  - 2. The dates analyses were performed;
  - 3. The analytical techniques/methods used;
  - 4. The results of such analyses; and
  - 5. The average daily and maximum daily flows.
- F. In the event of a sampling failure, including, but not limited to, failure of sampling equipment, or sample damage, contamination, or breakage, sampling shall be repeated as soon as possible at all applicable required monitoring locations for those parameters for which the analysis of the original sample(s) was intended.
- G. The 30 day resampling requirement of Part 1.0. of this Permit shall apply to all monitoring locations identified in this Permit. Where a violation of a plant mass limitation has occurred, all sites which contribute to the calculation of the plant mass shall be resampled concurrently. Only those parameters for which the violation has been identified are required to be analyzed as part of the resampling.
- H. Where agreed upon in advance by both parties, the POTW may perform monitoring and testing for a parameter(s) regulated by this permit and such POTW monitoring shall satisfy the self-monitoring requirement for the subject parameter(s).

#### PART 4 - EFFLUENT LIMITATIONS, SAMPLING AND TESTING REQUIREMENTS

- A. Local Limits: The Village of Sauget reserves the right in the Ordinance to establish limitations or requirements on discharges to the wastewater disposal system if deemed

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

necessary to comply with the objectives presented in Section 1.4 of the Ordinance.

Any Discharge to the Regional System from Site R shall not exceed either an ammonia nitrogen concentration of 50 mg/l in a 24-hour composite sample or 75 mg/l in a Grab sample or an ammonia nitrogen daily maximum mass of 50 lb/day. For purposes of this local limit, a discharger who complies with either of the ammonia nitrogen concentration limits or the daily maximum mass limit shall be deemed to be in compliance. The ammonia nitrogen mass in a discharge shall be determined by multiplying the daily flow volume times the 24-hour composite sample concentration times the appropriate conversion factor or, if a 24-hour composite sample is not available, times the Grab sample concentration, for the same day.

- B. State Limits: These limits are stated in 35 Ill. Adm. Code Part 307. This Part 307 places restrictions on the types, concentrations, and quantities of contaminants which can be discharged into sewer systems in the State.

Limitations:

<u>Parameters</u>	<u>Monthly Avg (mg/L)</u>	<u>Daily Composite (mg/L)</u>	<u>Grab Sample (mg/L)</u>
Mercury	0.0005	0.001	0.0025
Cyanide(total)	--	--	10.0
pH	--	--	6.0-10.0

Any sample tested shall not release more than 2 mg/l of cyanide when tested at a pH of 4.5 and at a temperature of 66°C (150°F) for a period of 30 minutes.

Subject to the averaging rule of Ill Adm. Code 304.104, the monthly average for mercury shall be the numerical average of all daily composites for mercury taken during a calendar month. A monthly average must be based on at least three daily composites.

- C. National Categorical Pretreatment Standards (NCPS):  
Not Applicable

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

D. Monitoring Schedule

1. The requirements of the monitoring schedule are effective as of the effective date of this Permit.
2. Monitoring locations are shown in the attached diagram, entitled "Figure 1", which is incorporated into and made a part of this Permit.
3. Monitoring frequencies:

<u>Parameter (units)</u>	<u>Monitoring Location</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
Ammonia nitrogen (mg/L)	A	See 4. below	Composite
Mercury (mg/L)	A	1/Qtr.	See 5. below
Cyanide (mg/L)	A	1/Qtr.	See 8. below
pH (S.U.)	A	1/Qtr.	Grab
Flow	A	Daily	Meter
Parameters per part 4.D.9. below	A	Monthly	See 5. & 7. below

4. Compliance with the ammonia nitrogen local limit will be determined by testing performed by the POTW. Permittee self-monitoring for ammonia nitrogen is not required.

5. Daily composite samples for parameters other than volatile organics and cyanide shall be obtained from the composite sampler at monitoring location A.

6. A sampling day is a 24-hour period with the sample date designated as the date beginning the 24-hr period.

7. Grab samples for volatile organics shall consist of a minimum of (2) two grab samples taken within a 24-hour period with at least 8 hours between the minimum two samples. If more than 2 grabs are taken, the collection of these samples should be representative of the 24-hour period. The individual 40ml VOA grabs shall be equally composited in the laboratory into one sample for analysis.

8. Grab samples for cyanide shall consist of a single grab sample collected during the sampling day.

9. Site Specific Monitoring Parameters

<u>Volatiles</u>	<u>Sample Type</u>	<u>Base/Neutral</u>	<u>Sample type</u>
Benzene	Grab	Aniline	Comp
Chlorobenzene	Grab	1,2-dichlorobenzene	Comp
Chloroethane	Grab	1,3-dichlorobenzene	Comp
Chloroform	Grab	1,4-dichlorobenzene	Comp
1,1-dichloroethane	Grab	Nitrobenzene	Comp
1,2-dichloroethane	Grab	1,2,4-trichlorobenzene	Comp
1,1-dichloroethylene	Grab	2-chloroaniline	Comp
Ethylbenzene	Grab	4-chloroaniline	Comp
Methylene chloride	Grab	2-Nitroaniline	Comp
Methyl ethyl Ketone	Grab	2-Nitrochlorobenzene	Comp
Tetrachloroethylene	Grab	3-Chloroaniline	Comp
Toluene	Grab	3-Nitrochlorobenzene	Comp
1,2-trans-dichloroethylene	Grab	4-Nitroaniline	Comp
Trichloroethylene	Grab	4-Nitrochlorobenzene	Comp
Vinyl chloride	Grab		
Xylenes	Grab	<u>Acid Compounds</u>	
4-methyl-2-pentanone	Grab	2-chlorophenol	Comp
		2,4-dichlorophenol	Comp
<u>Herbicides</u>	<u>Sample Type</u>	2-nitrophenol	Comp
2,4-D	Comp	4-nitrophenol	Comp
		Pentachlorophenol	Comp
		Phenol	Comp
		2,4,5-trichlorophenol	Comp
		2,4,6-trichlorophenol	Comp
		o-Cresol	Comp
		m & p-cresol	Comp

PART 5 - COMPLIANCE SCHEDULE

A. General:

Authority Citation: Section 4.13 Village of Sauget Pre-treatment Ordinance No. 632, as amended.

Permit No. 06-138

Owner: Solutia, Inc.

Operator: Solutia, Inc.

Facility Name: Site R Remediation Site

Authorized Discharge: UAO Remediation Wastewater, as defined in Section 4.17.1 of Ordinance 632, as amended.

B. Final Compliance Date: Not applicable

PART 6 - SPECIAL CONDITIONS

- A. Cost of Service: The Ordinance provides that the cost of the Pretreatment Program, including special sampling analysis, Monitoring, etc. be recovered from the customer causing the incurrence of the cost.
- B. Applicability: Pursuant to Section 4.17.2 of the Ordinance, the discharge of UAO Remediation Wastewater is subject to the provisions of this Ordinance applicable to a discharge of wastewater. A discharger of UAO Remediation Wastewater is subject to all rate ordinances adopted by the Village of Sauget that are applicable to Industrial Users and Significant Industrial Users.
- C. Unlawful Discharges of Remediation Wastewater: It shall be unlawful for any person to cause or allow the discharge of UAO Remediation Wastewater to the POTW unless such person is in possession of a current and valid Wastewater Discharge Permit issued expressly for the purpose of discharging the UAO Remediation Wastewater.
- D. Additional Permit Terms and Conditions: In addition to the provisions of Section 4.6 of the Ordinance, this Permit for the discharge of UAO Remediation Wastewater is subject to the following terms and conditions:
1. When and as directed by the POTW, Solutia shall control the commencement, reduction or resumption of the discharge of the UAO Remediation Wastewater, including but not limited to, limitations on flow rate, flow volume and mass loadings of specific contaminants.
  2. When directed by the POTW, Solutia shall immediately cease the discharge of UAO Remediation Wastewater or adjust the flow rate to protect against threats to the integrity of the POTW treatment processes, worker safety or the environment.
  3. The POTW reserves the right to modify this Permit to include additional limitations on the concentration or mass of specific or categorical chemical compounds in the UAO Remediation Wastewater discharge, including the prohibition of

the discharge of any hazardous air pollutants within the meaning of the Clean Air Act that may cause or contribute to a violation of the POTW's Clean Air Act Permit. Any such modification shall be made pursuant to the notice procedures of Section 4.10 of the Ordinance.

4. Solutia shall maintain, keep in proper working order, and periodically test the shutdown systems for the UAO Remediation Wastewater discharge.

5. Solutia shall maintain and keep in proper working order secure discharge control valve(s), pump electrical supply disconnect switch or similar device for the use of the POTW to halt the discharge when required pursuant to the provisions of Section 6.D.2 above and the Ordinance for cessation or reduction of the UAO Remediation Wastewater discharge, which equipment may be required to be located on property owned or otherwise controlled by the Village.

6. The POTW reserves the right to add powdered activated carbon (PAC) in order to protect against threats to the integrity of the POTW treatment processes, worker safety or the environment. The decision of whether to add PAC shall be within the sole discretion of the Executive Director, using best professional judgment and in consideration of acceptable ambient and operational conditions.

- E. Indemnification: Solutia shall defend, indemnify and hold harmless the Village, the Village Board and the Association from and against any and all legal, equitable or other claims, losses, liabilities, damages (including, but not limited to, damage caused to POTW treatment equipment), civil penalties, injunctive relief, injuries to persons, injuries to real property, injuries to personal property, costs, and expenses, (including, but not limited to, reasonable attorneys', accountants' and consultants' fees, costs and expenses), whether foreseeable or unforeseeable, as a direct or indirect result of, the discharge of the UAO Remediation Wastewater to the POTW or the treatment of the UAO Remediation Wastewater by the POTW. This indemnification shall not cover claims, losses, liabilities, damages, civil penalties, injunctive relief, injuries to persons, injuries

Site R - UAO Remediation Wastewater # V-W-02-C-716 - Solutia, Inc.

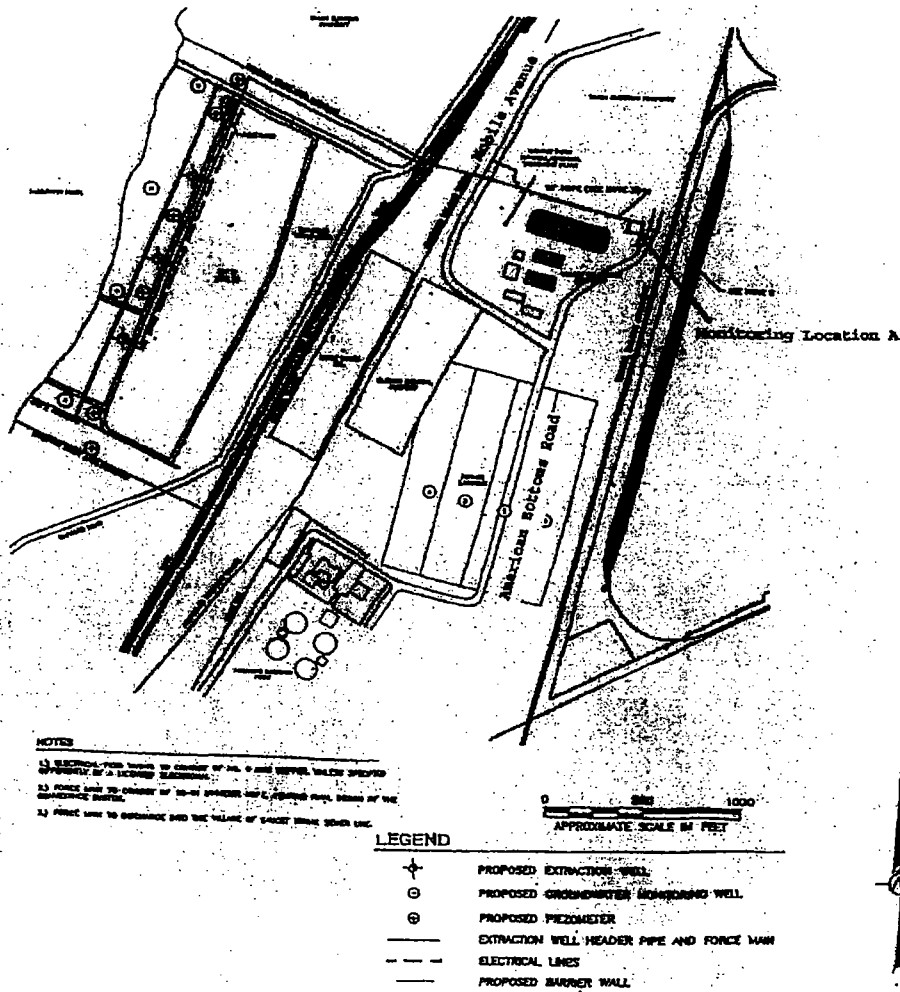
to real property, injuries to personal property, and expenses arising directly or indirectly from: (i) the Village's, Village Board's, and/or the Association's liability, if any, for Sauget Areas 1 and 2 under CERCLA, or (ii) the negligent operation of the POTW, including, but not limited to, any negligent handling or treatment of the UAO Remediation Wastewater.

- F. Waiver of Claims: By accepting and discharging UAO Remediation Wastewater under this Permit, Solutia hereby agrees to waive any claims against the Village, the Village Board and Association by the permittee for any liability incurred by the permittee under the UAO due to any shutdown or reduction in flow of the discharge ordered by the POTW.
- G. Waiver of Affirmative Defenses: By accepting and discharging UAO Remediation Wastewater under this Permit, Solutia hereby agrees to waive the affirmative defenses set forth in Section 3.2.3 of the Ordinance, for any alleged violation relating to the discharge of UAO Remediation Wastewater.



Permit No. 06-138

FIGURE 1 - MONITORING LOCATION



AMERICAN BOTTOMS REGIONAL TREATMENT PLANT  
INDUSTRIAL WASTEWATER DISCHARGE PERMIT  
FACT SHEET

Date 08-15-2006

**Section 1 Description of the Permittee**

Facility Name: Site R- UAO Remediation Wastewater  
Wastewater # V-W-02-C-716

Facility Site Address: #5 Riverview Ave., Sauget, IL 62201

Facility Mailing Address: 500 Monsanto Ave., Sauget, IL 62206

Total Number of Monitoring connections: 1

Monitoring Location	Regulated Process	Unregulated Process	Dilution	Locally Regulated
Loc. A	No	No	No	Yes

Brief description of the facility processes: The Site R discharge consists of "UAO Remediation Wastewater" as that term is defined in Section 4.17 of Ordinance 632, as amended. Solutia has implemented a Groundwater Mitigation Control System (GMCS) for the Site R discharge. Three extraction wells are onsite to recover impacted groundwater for treatment by American Bottoms. A subsurface barrier wall has been constructed to prevent the discharge of impacted groundwater to the Mississippi River.

Categorical Industry: Yes \_\_\_\_\_ No x

If Yes, 40 CFR \_\_\_\_\_ Subpart(s) \_\_\_\_\_

SIC Code(s): N/A

**Section 2 Type and Quantity of Discharge**

Monitoring Location: Site R - Location A  
Includes processes: Untreated groundwater

Average daily flow: The measured average daily flow from November 1, 2004-February 28, 2006 was 1.05 mgd. The barrier wall trench was completed in September 2004 and backfilling of the trench was completed in November 2004. The permit application estimates that the average discharge will be 0.770 mgd. Based on hydrogeologic modeling, the daily average flow was predicted to be approximately 0.8 MGD with the barrier wall installed.

Categorical flow: No  
Non-regulated flow: No  
Domestic/sanitary flow: No

List of pollutants present in discharge, which are subject to limitations or prohibitions: Cyanide-Total, ammonia-nitrogen, mercury, and site specific parameters listed in Attachment A.

### Section 3 Rationale for Permit Limits

Monitoring Location(s): Site R Loc. A

Pollutants to be limited:	Regulatory Citation Applied at monitoring Location
Local limits: <u>NH3</u>	<u>Ordinance No.632 3.3.4.4</u>
State limits: <u>Hg</u>	<u>35 Ill. Adm. Code 307.1102</u>
State limits: <u>CN</u>	<u>35 Ill. Adm. Code 307.1103</u>
Categorical limits: <u>No</u>	<u></u>

Production Based Stds Calculation Sheets: Yes\_\_\_ No\_\_\_ N/A x

If Yes, for sampling point:

Combined Wastestreams Calculation Sheets: Yes\_\_\_ No\_\_\_ N/A x

If Yes, for sampling point:

Equivalent concentration or mass based Calculation

Sheets: Yes\_\_\_ No\_\_\_ N/A x

If Yes, for sampling point:

Other Notes: None

### Section 4 Special Conditions

The permit contains the following special conditions:

- A. Cost of Service: The Ordinance provides that the cost of the Pretreatment Program, including special sampling analysis, Monitoring, etc. be recovered from the customer causing the incurrence of the cost.
- B. Applicability: Pursuant to Section 4.17.2 of the Ordinance, the discharge of UAO Remediation Wastewater is subject to the provisions of this Ordinance applicable to a discharge of wastewater. A discharger of UAO Remediation Wastewater is subject to all rate ordinances adopted by the Village of Sauget that are applicable to Industrial Users and Significant Industrial Users.

- C. Unlawful Discharges of Remediation Wastewater: It shall be unlawful for any person to cause or allow the discharge of UAO Remediation Wastewater to the POTW unless such person is in possession of a current and valid Wastewater Discharge Permit issued expressly for the purpose of discharging the UAO Remediation Wastewater.
- D. Additional Permit Terms and Conditions: In addition to the provisions of Section 4.6 of the Ordinance, this Permit for the discharge of UAO Remediation Wastewater is subject to the following terms and conditions:
1. When and as directed by the POTW, Solutia shall control the commencement, reduction or resumption of the discharge of the UAO Remediation Wastewater, including but not limited to, limitations on flow rate, flow volume and mass loadings of specific contaminants.
  2. When directed by the POTW, Solutia shall immediately cease the discharge of UAO Remediation Wastewater or adjust the flow rate to protect against threats to the integrity of the POTW treatment processes, worker safety or the environment.
  3. The POTW reserves the right to modify this Permit to include additional limitations on the concentration or mass of specific or categorical chemical compounds in the UAO Remediation Wastewater discharge, including the prohibition of the discharge of any hazardous air pollutants within the meaning of the Clean Air Act that may cause or contribute to a violation of the POTW's Clean Air Act Permit. Any such modification shall be made pursuant to the notice procedures of Section 4.10 of the Ordinance.
  4. Solutia shall maintain, keep in proper working order, and periodically test the shutdown systems for the UAO Remediation Wastewater discharge.
  5. Solutia shall maintain and keep in proper working order secure discharge control valve(s),

pump electrical supply disconnect switch or similar device for the use of the POTW to halt the discharge when required pursuant to the provisions of Section 6.D.2 above and the Ordinance for cessation or reduction of the UAO Remediation Wastewater discharge, which equipment may be required to be located on property owned or otherwise controlled by the Village.

6. The POTW reserves the right to add powdered activated carbon (PAC) in order to protect against threats to the integrity of the POTW treatment processes, worker safety or the environment. The decision of whether to add PAC shall be within the sole discretion of the Executive Director, using best professional judgment and in consideration of acceptable ambient and operational conditions.

E. Indemnification: Solutia shall defend, indemnify and hold harmless the Village, the Village Board and the Association from and against any and all legal, equitable or other claims, losses, liabilities, damages (including, but not limited to, damage caused to POTW treatment equipment), civil penalties, injunctive relief, injuries to persons, injuries to real property, injuries to personal property, costs, and expenses, (including, but not limited to, reasonable attorneys', accountants' and consultants' fees, costs and expenses), whether foreseeable or unforeseeable, as a direct or indirect result of, the discharge of the UAO Remediation Wastewater to the POTW or the treatment of the UAO Remediation Wastewater by the POTW. This indemnification shall not cover claims, losses, liabilities, damages, civil penalties, injunctive relief, injuries to persons, injuries to real property, injuries to personal property, and expenses arising directly or indirectly from: (i) the Village's, Village Board's, and/or the Association's liability, if any, for Sauget Areas 1 and 2 under CERCLA, or (ii) the negligent operation of the POTW, including, but not limited to, any negligent handling or treatment of the UAO Remediation Wastewater.

F. Waiver of Claims: By accepting and discharging UAO Remediation Wastewater under this Permit, Solutia hereby agrees to waive any claims against the Village, the Village Board and Association by the permittee for any liability

incurred by the permittee under the UAO due to any shutdown or reduction in flow of the discharge ordered by the POTW.

- G. Waiver of Affirmative Defenses: By accepting and discharging UAO Remediation Wastewater under this Permit, Solutia hereby agrees to waive the affirmative defenses set forth in Section 3.2.3 of the Ordinance, for any alleged violation relating to the discharge of UAO Remediation Wastewater.

Slug Plan Required: Yes\_\_\_ No x

The discharges from the Site R facility, as explained above, consist of groundwater from three extraction wells onsite to recover impacted groundwater for treatment at American Bottoms. A subsurface barrier wall has been constructed to prevent the discharge of impacted groundwater to the Mississippi River. Site R is not required to have a slug control plan at this time.

#### Section 5 Monitoring Requirements

Monitoring Location: 138 A - Fenceline

Monitoring Frequencies:	Parameter	Frequency
	Flow-fenceline	Daily
	Hg	Quarterly
	CN	Quarterly
	pH	Quarterly
	Volatiles	Monthly
	Semivolatile - Acids	Monthly
	Semivolatile - Base/Neutral	Monthly
	Herbicides	Monthly

#### Rationale for Monitoring Frequency:

Mercury, cyanide, and pH monitoring frequencies will be reduced from monthly to quarterly based on two years of monitoring data showing no violations and no potential to exceed permit limits. See Attachment B for the reasonable potential analysis performed. Monitoring frequencies for volatiles, semi-volatiles, and herbicides will remain monthly. The POTW currently monitors the flow on a daily basis and performs the sampling and analytical for the requirements of the current discharge permit. The POTW will continue to conduct this work. Other sampling related to process control will be conducted by the POTW.

Attachment A contains a list of site-specific volatiles, semi-volatile acids & bases, and herbicides. Volatile, semi-volatile acids & bases, and herbicide analytical data was reviewed (June 2004-March 2006 and the parameters listed in Attachment B are the parameters have been identified and remain unchanged.

Attachment A

Site Specific Discharge Parameters

<u>Volatiles</u>	<u>Sample type</u>	<u>Base/Neutral</u>	<u>Sample type</u>
Benzene	Grab	Aniline	Comp
Chlorobenzene	Grab	1,2-dichlorobenzene	Comp
Chloroethane	Grab	1,3-dichlorobenzene	Comp
Chloroform	Grab	1,4-dichlorobenzene	Comp
1,1-dichloroethane	Grab	Nitrobenzene	Comp
1,2-dichloroethane	Grab	1,2,4-trichlorobenzene	Comp
1,1-dichloroethylene	Grab	2-chloroaniline	Comp
Ethylbenzene	Grab	4-chloroaniline	Comp
Methylene chloride	Grab	2-Nitroaniline	Comp
Methyl ethyl Ketone	Grab	2-Nitrochlorobenzene	Comp
Tetrachloroethylene	Grab	3-Chloroaniline	Comp
Toluene	Grab	3-Nitrochlorobenzene	Comp
1,2-trans-dichloroethylene	Grab	4-Nitroaniline	Comp
Trichloroethylene	Grab	4-Nitrochlorobenzene	Comp
Vinyl chloride	Grab		
Xylenes	Grab	<u>Acid Compounds</u>	
4-methyl-2-pentanone	Grab	2-chlorophenol	Comp
		2,4-dichlorophenol	Comp
		2-nitrophenol	Comp
		4-nitrophenol	Comp
		Pentachlorophenol	Comp
		Phenol	Comp
		2,4,5-trichlorophenol	Comp
		2,4,6-trichlorophenol	Comp
		o-Cresol	Comp
		m & p-cresol	Comp
<u>Herbicides</u>	<u>Sample Type</u>		
2,4-D	Comp		



## Attachment B

## REASONABLE POTENTIAL ANALYSIS

FOR

## SITE R TO EXCEED PERMIT LIMITS

PARAMETER	LIMIT TYPE	LIMIT VALUE (A)	OBSERVED EFFLUENT MAXIMUM (B)	NUMBER OF EFFLUENT DATA	COEFFI- CIENT OF VARIANCE	REASONABLE POTENTIAL MULTIPLIER (C) *	MAXIMUM EFFLUENT AT REASONABLE POTENTIAL (D) = (C) * (B)	REASONABLE POTENTIAL TO EXCEED LIMIT (D) > (A) ?
HG - 1/1/04-12/31/05	MA mg/L	0.0005	0.0003	37	2.912	1.4	0.000	No
CN - 1/1/04-12/31/05	GRAB mg/L	10	0.0000	33	0.00	1.1	0.000	No
PH - 1/1/04-12/31/05	GRAB SU	10	8.7000	52	0.076	1.1	9.570	No

\* (C): RP MULTIPLIER "FLOOR" IS 1.1, PER IEPA MZ DOCUMENT

Time Frame 1/1/04 - 12/31/05 is 24 months